

Quality of cryo-EM reconstruction assessed by atomic model building

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Affiliations:

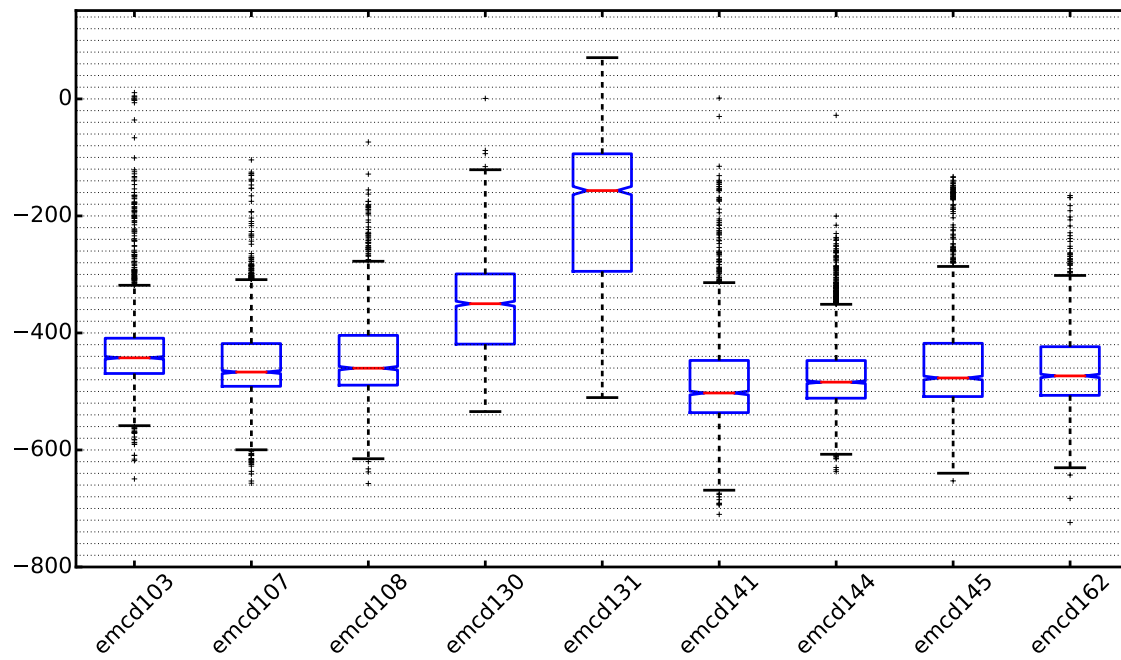
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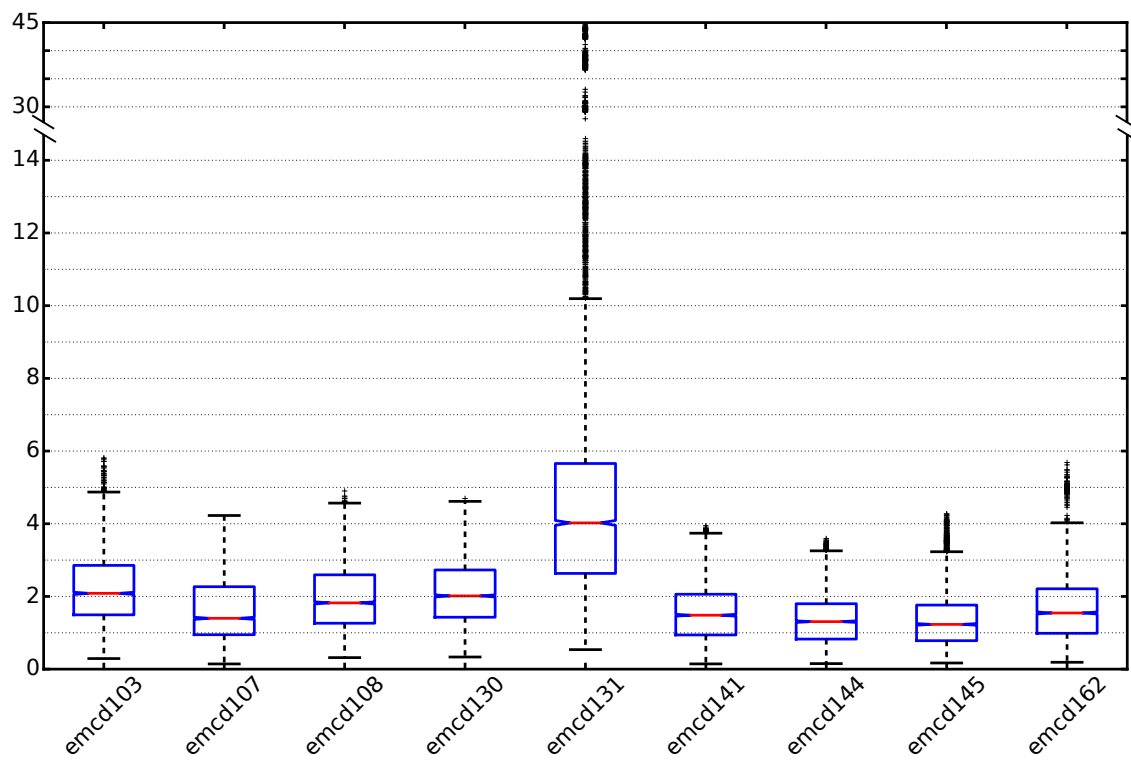
³ Department of Chemistry and Biochemistry, 95 Chieftain Way, Florida State University, Tallahassee, FL 32306.

Proteasome

Combined score

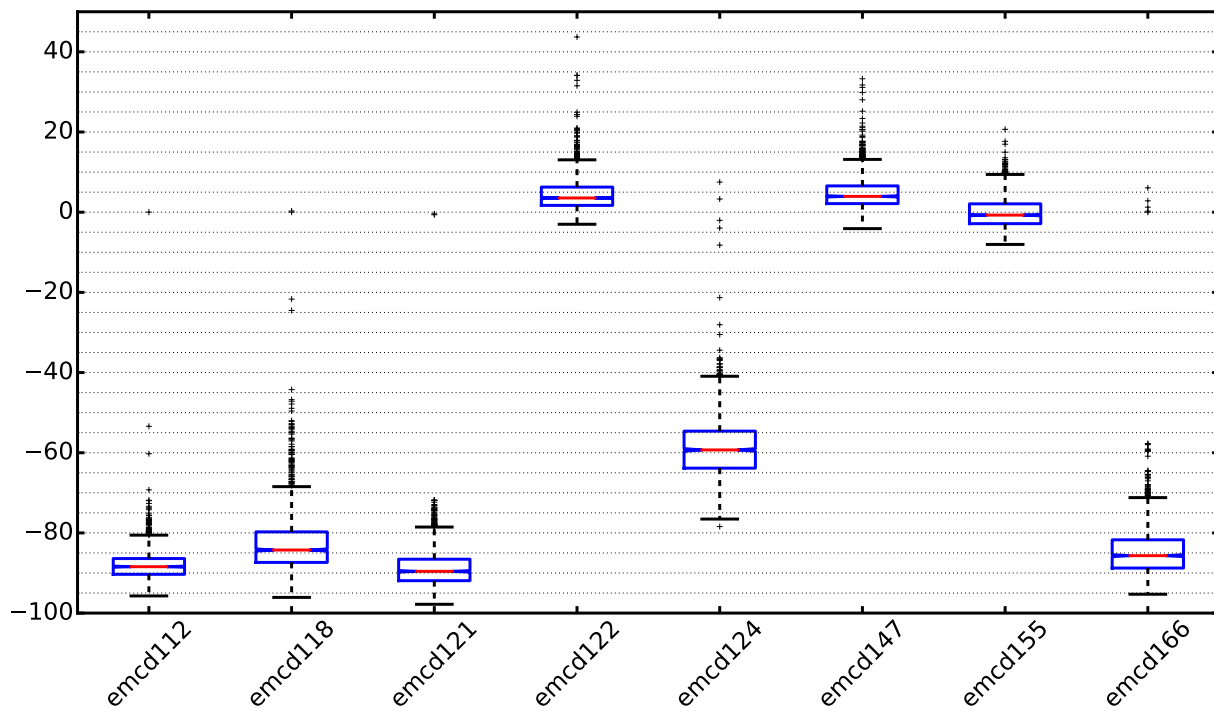


Internal RMSD

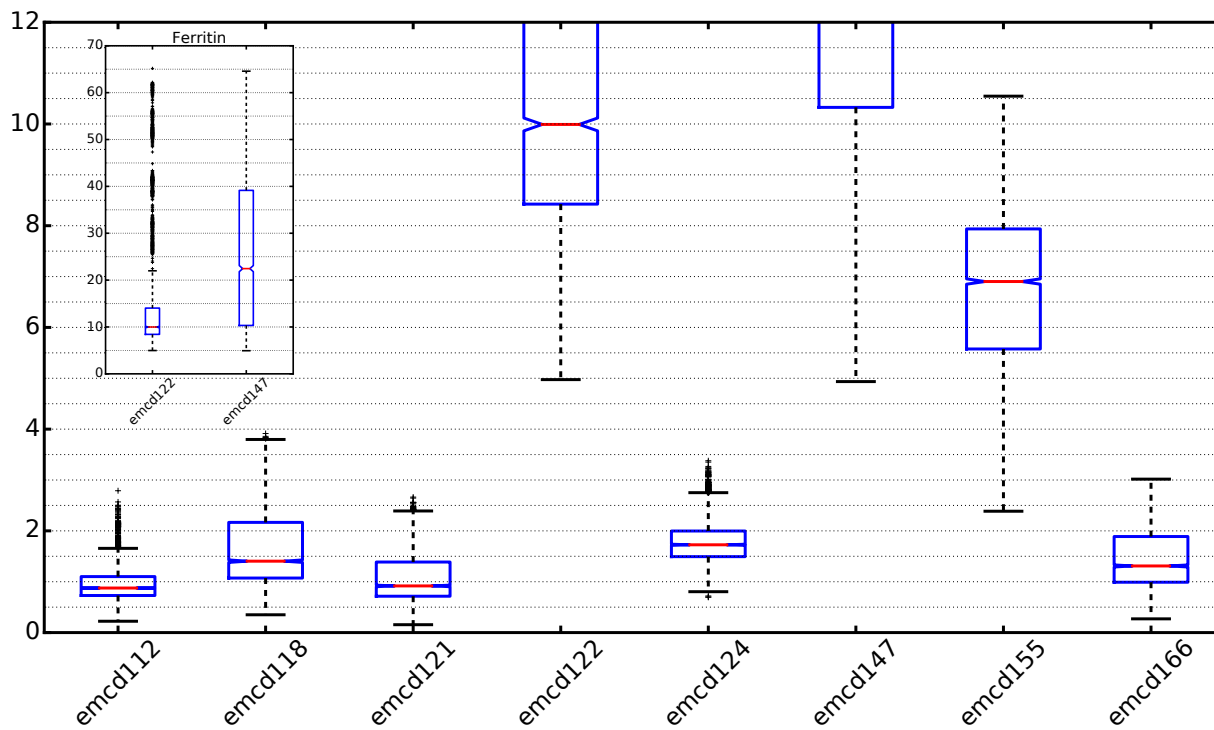


Apo-Ferritin

Combined score



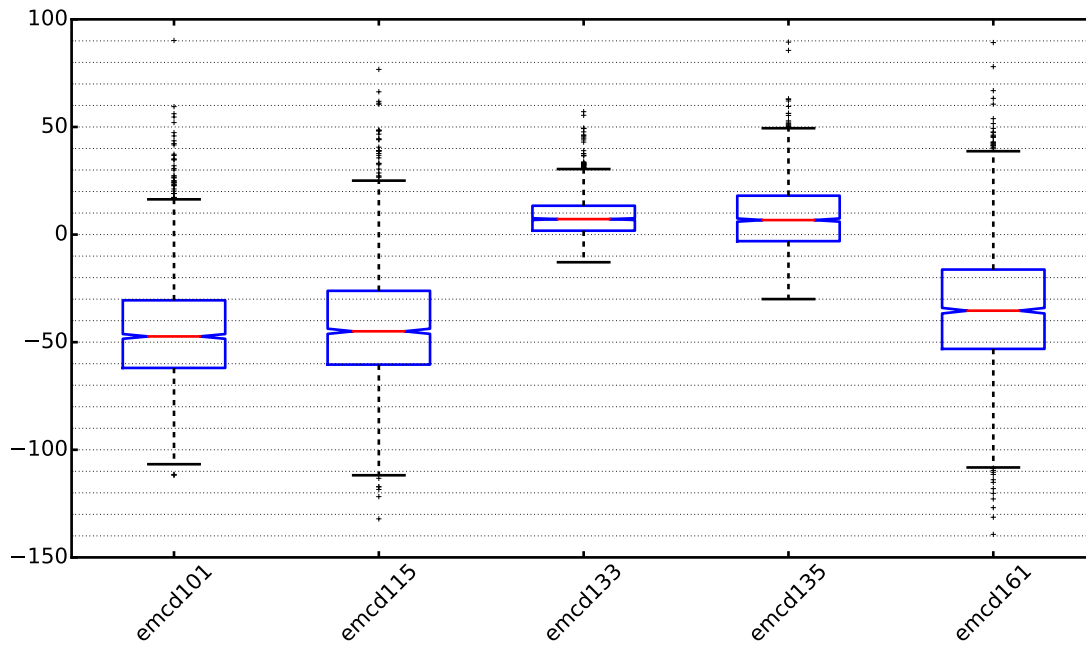
Internal RMSD



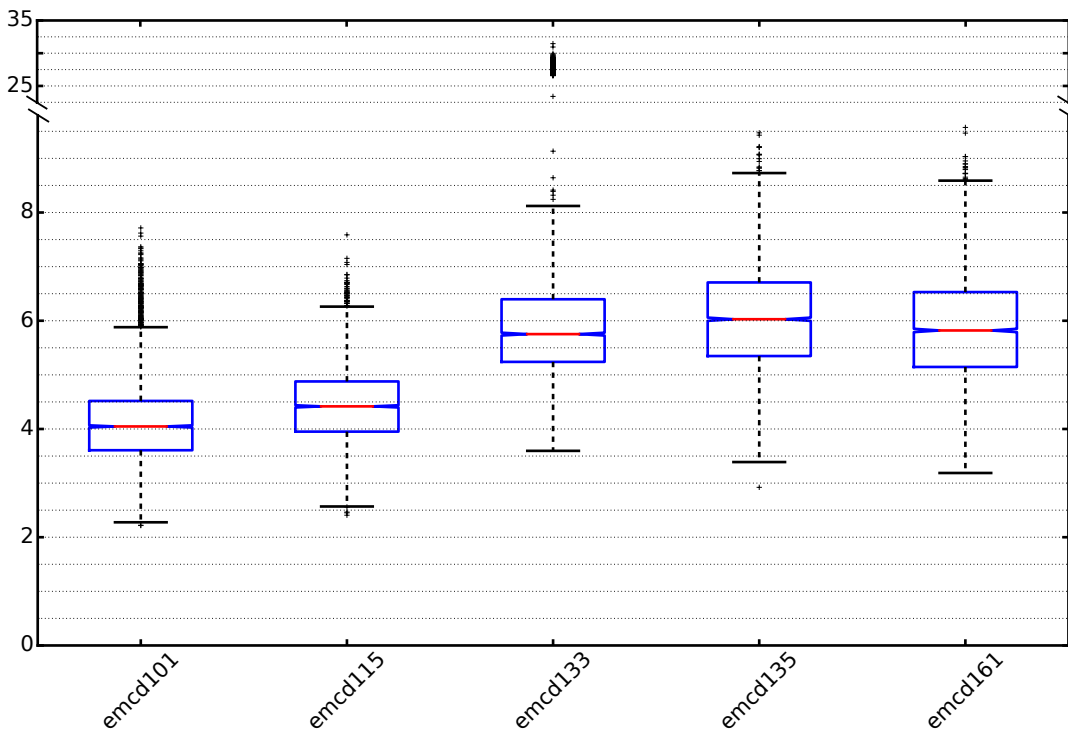
TRPV1

Models emcd146 and emcd156 could not be automatically modeled without extensive manual intervention, so they were excluded from our analysis.

Combined score



Internal RMSD



TRPV1

	Combined Score	Internal RMSD
emcd101	1	1
emcd115	2	2
emcd133	4 / 5	3 / 4
emcd135	4 / 5	5
emcd161	3	3 / 4

Kruskal-Wallis rank sum test
 Dunn's Test pairwise comparisons
 p-value = 0.05

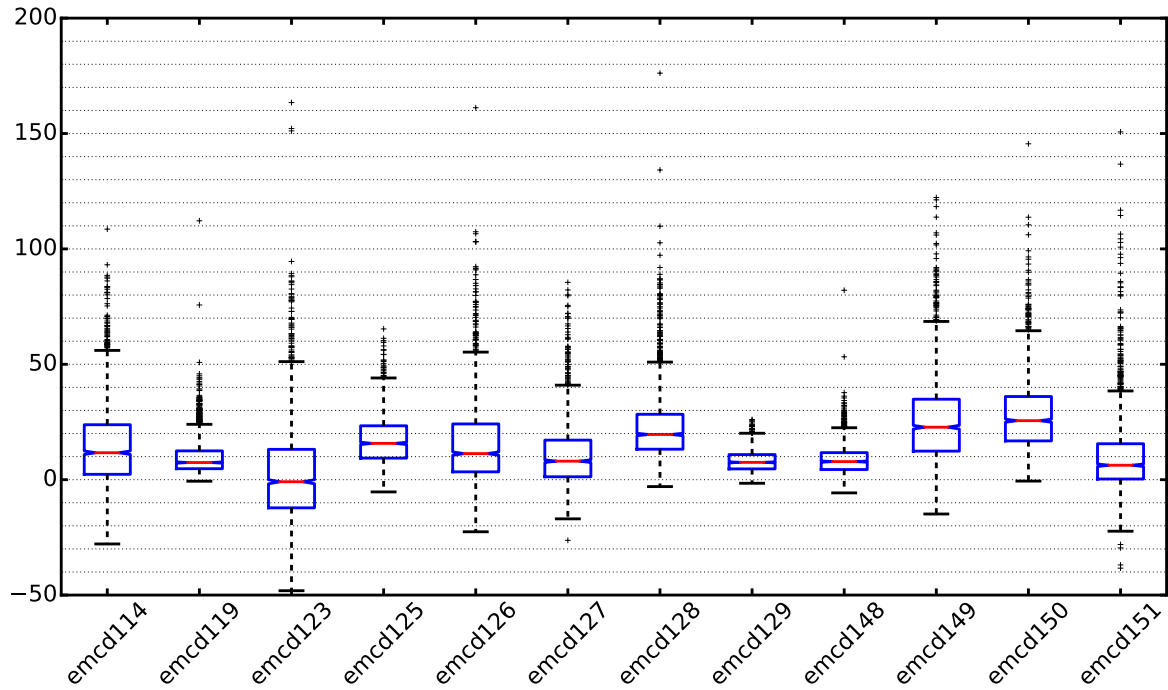
	emcd101	emcd115	emcd133	emcd135	emcd161	Combine Score
emcd101		<0.0001	<0.0001	<0.0001	<0.0001	
emcd115	<0.0001		<0.0001	<0.0001	<0.0001	
emcd133	<0.0001	<0.0001		<0.0001	<0.0001	
emcd135	<0.0001	<0.0001	0.1290		<0.0001	
emcd161	<0.0001	<0.0001	<0.0001	<0.0001		

	emcd101	emcd115	emcd133	emcd135	emcd161	Internal RMSD
emcd101		<0.0001	<0.0001	<0.0001	<0.0001	
emcd115	<0.0001		<0.0001	<0.0001	<0.0001	
emcd133	<0.0001	<0.0001		<0.0001	0.0560	
emcd135	<0.0001	<0.0001	<0.0001		<0.0001	
emcd161	<0.0001	<0.0001	0.0560	<0.0001		

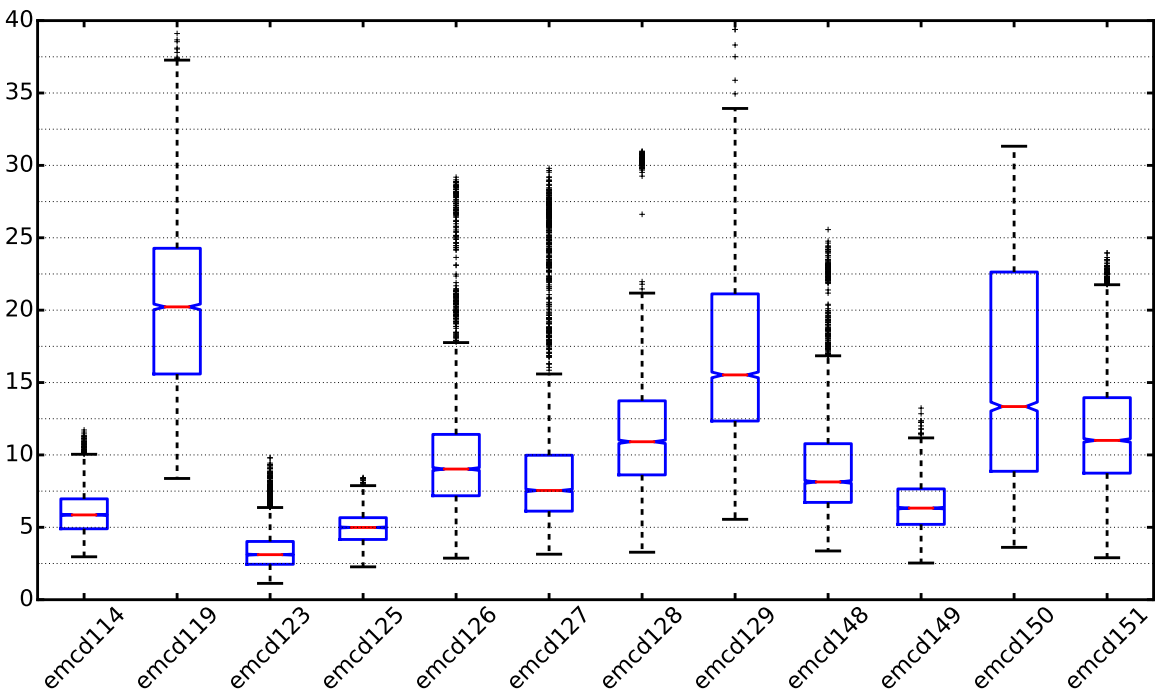
80S Ribosome

Model emcd111 could not be automatically modeled without extensive manual intervention, so it was excluded from our analysis.

Combined score



Internal RMSD



80S Ribosome

	Combined Score	Internal RMSD
emcd114	7 / 8	3
emcd119	4 / 6	12
emcd123	1	1
emcd125	9	2
emcd127	7 / 8	7
emcd126	4 / 6	5
emcd128	10 / 11	8 / 9
emcd129	2 / 3 / 5	11
emcd148	2 / 3 / 5	6
emcd149	10 / 11	4
emcd150	12	10
emcd151	2 / 3 / 5	8 / 9

Kruskal-Wallis rank sum test
 Dunn's Test pairwise comparisons
 p-value = 0.05

	emcd114	emcd119	emcd123	emcd125	emcd126	emcd127	emcd128	emcd129	emcd148	emcd149	emcd150	emcd151
emcd114		<0.0001	<0.0001	<0.0001	0.1309	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
emcd119	<0.0001		<0.0001	<0.0001	<0.0001	0.1309	<0.0001	0.0001	0.0069	<0.0001	<0.0001	0.0037
emcd123	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
emcd125	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
emcd126	0.1309	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
emcd127	<0.0001	0.2627	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	0.0010	<0.0001	<0.0001	0.0027
emcd128	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	0.1812	<0.0001	<0.0001
emcd129	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		0.0826	<0.0001	<0.0001	0.1208
emcd148	<0.0001	0.0069	<0.0001	<0.0001	<0.0001	0.0010	<0.0001	0.0826		<0.0001	<0.0001	0.4144
emcd149	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.1812	<0.0001	<0.0001		<0.0001	<0.0001
emcd150	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001
emcd151	<0.0001	0.0037	<0.0001	<0.0001	<0.0001	0.0027	<0.0001	0.1208	0.4144	<0.0001	<0.0001	

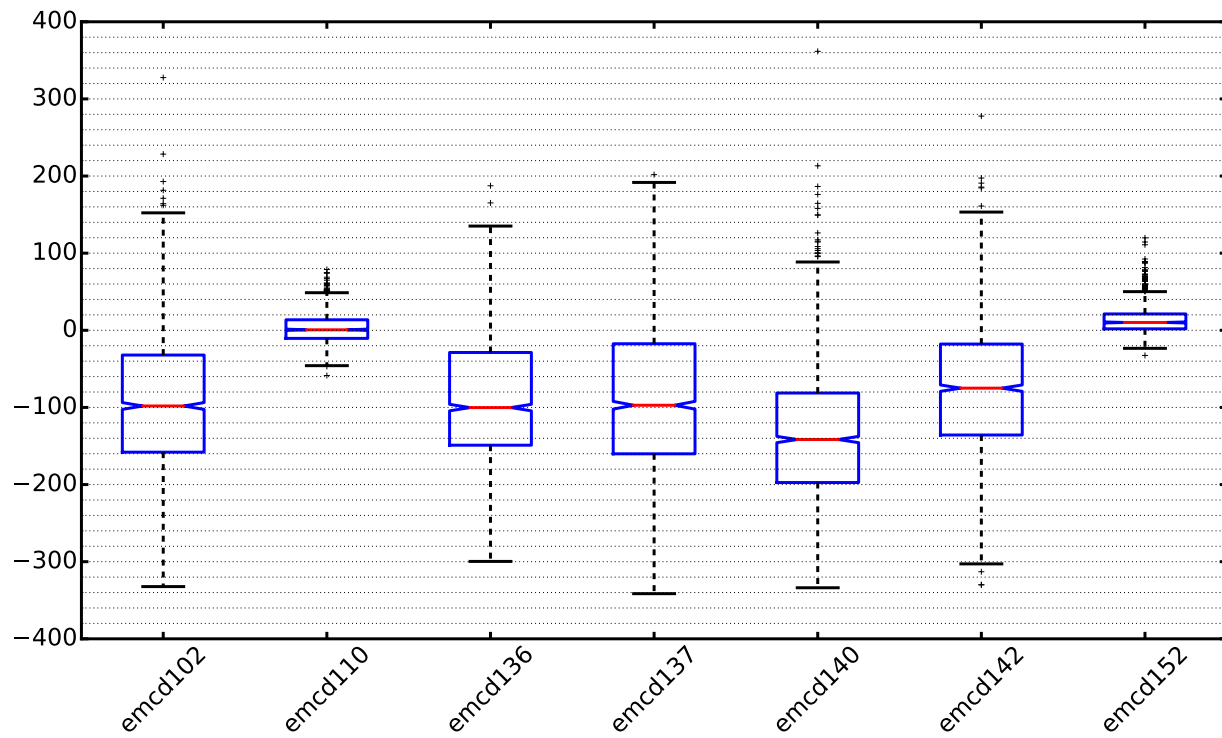
Combine Score

	emcd114	emcd119	emcd123	emcd125	emcd126	emcd127	emcd128	emcd129	emcd148	emcd149	emcd150	emcd151
emcd114		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
emcd119	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
emcd123	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
emcd125	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
emcd126	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
emcd127	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
emcd128	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	0.4341
emcd129	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001
emcd148	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001
emcd149	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001
emcd150	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001
emcd151	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.4341	<0.0001	<0.0001	<0.0001	<0.0001	

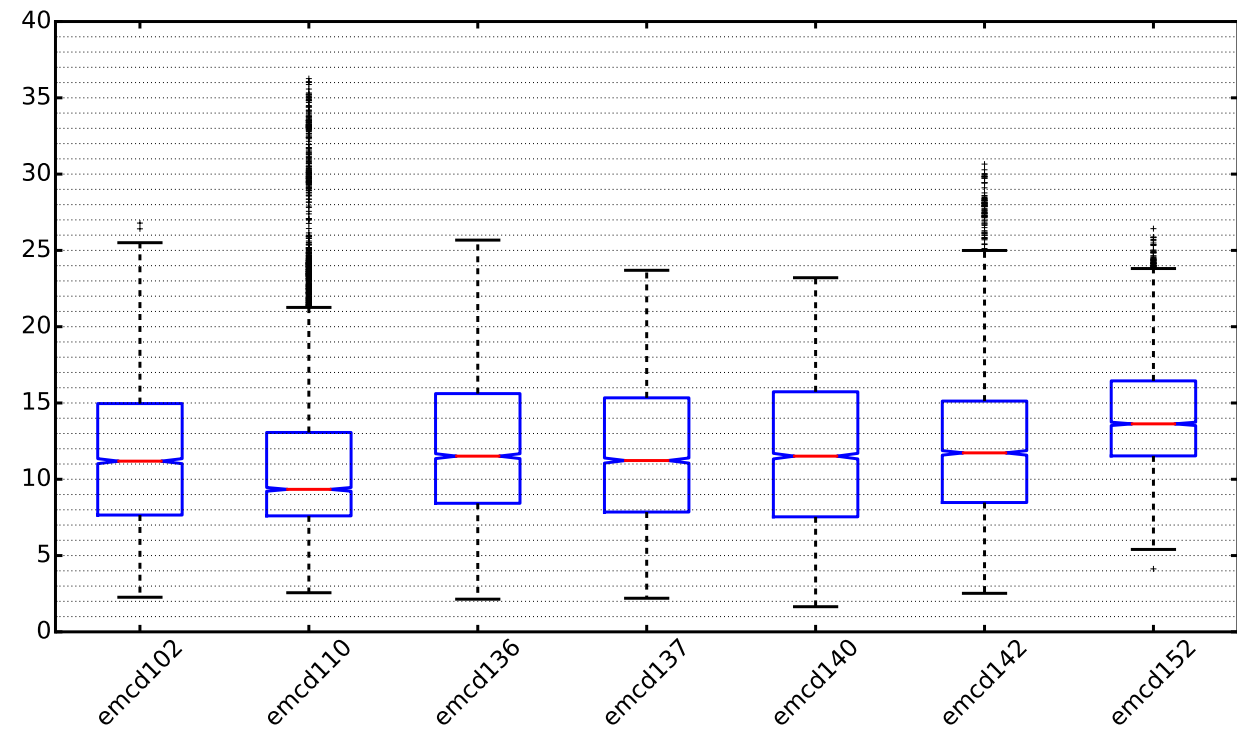
Internal RMSD

Brome Mosaic Virus

Combined score



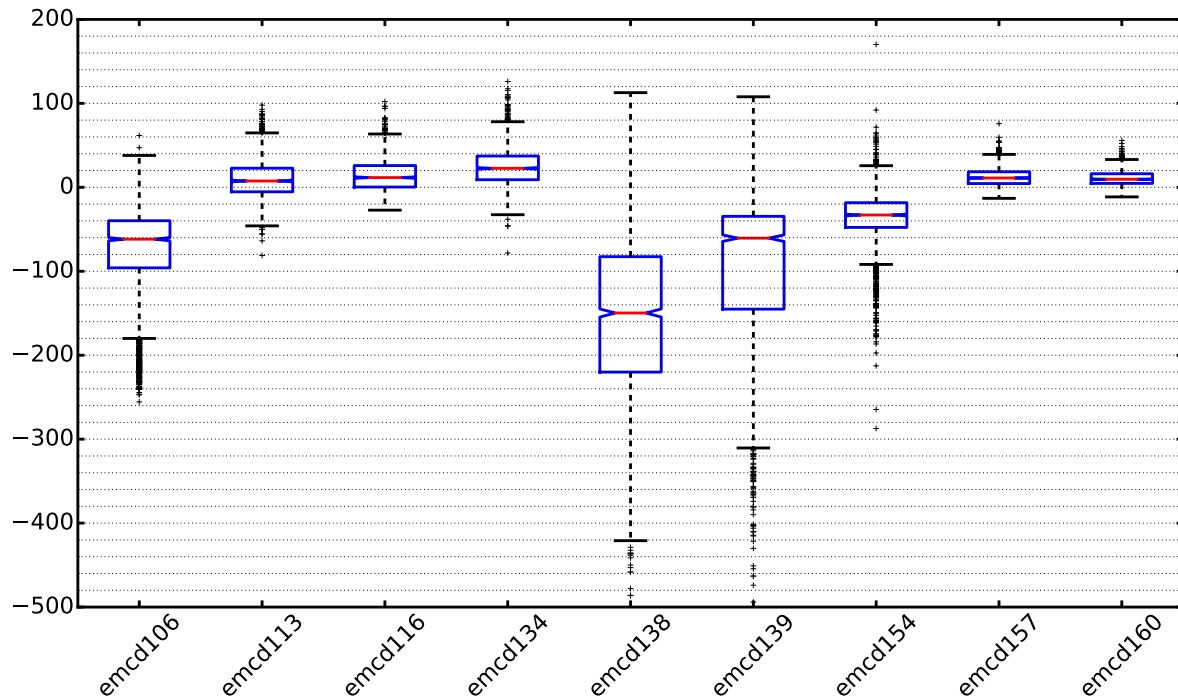
Internal RMSD



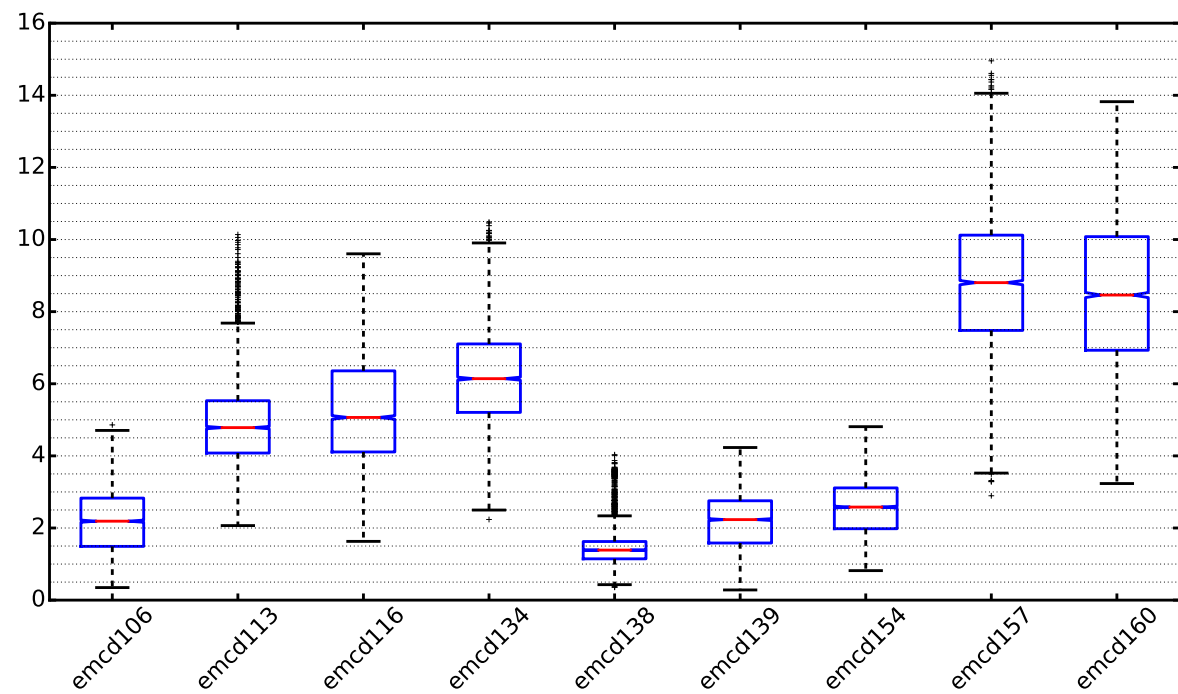
β Galactosidase

Models emcd159, emcd164 and emcd167 could not be automatically modeled without extensive manual intervention, so they were excluded from our analysis.

Combined score



Internal RMSD



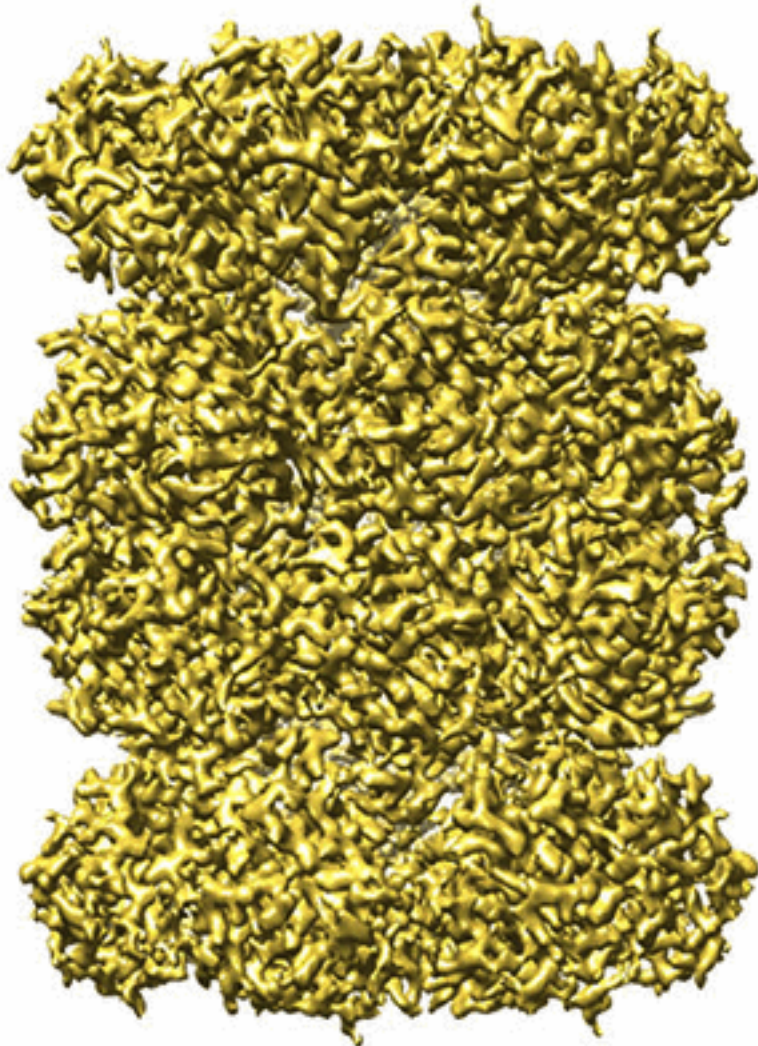
β Galactosidase

	Combined Score	Internal RMSD
emcd106	2 / 3	2 / 3
emcd113	5	5
emcd116	6 / 7 / 8	6
emcd134	9	7
emcd138	1	1
emcd139	2 / 3	2 / 3
emcd154	4	4
emcd157	6 / 7 / 8	9
emcd160	6 / 7 / 8	8

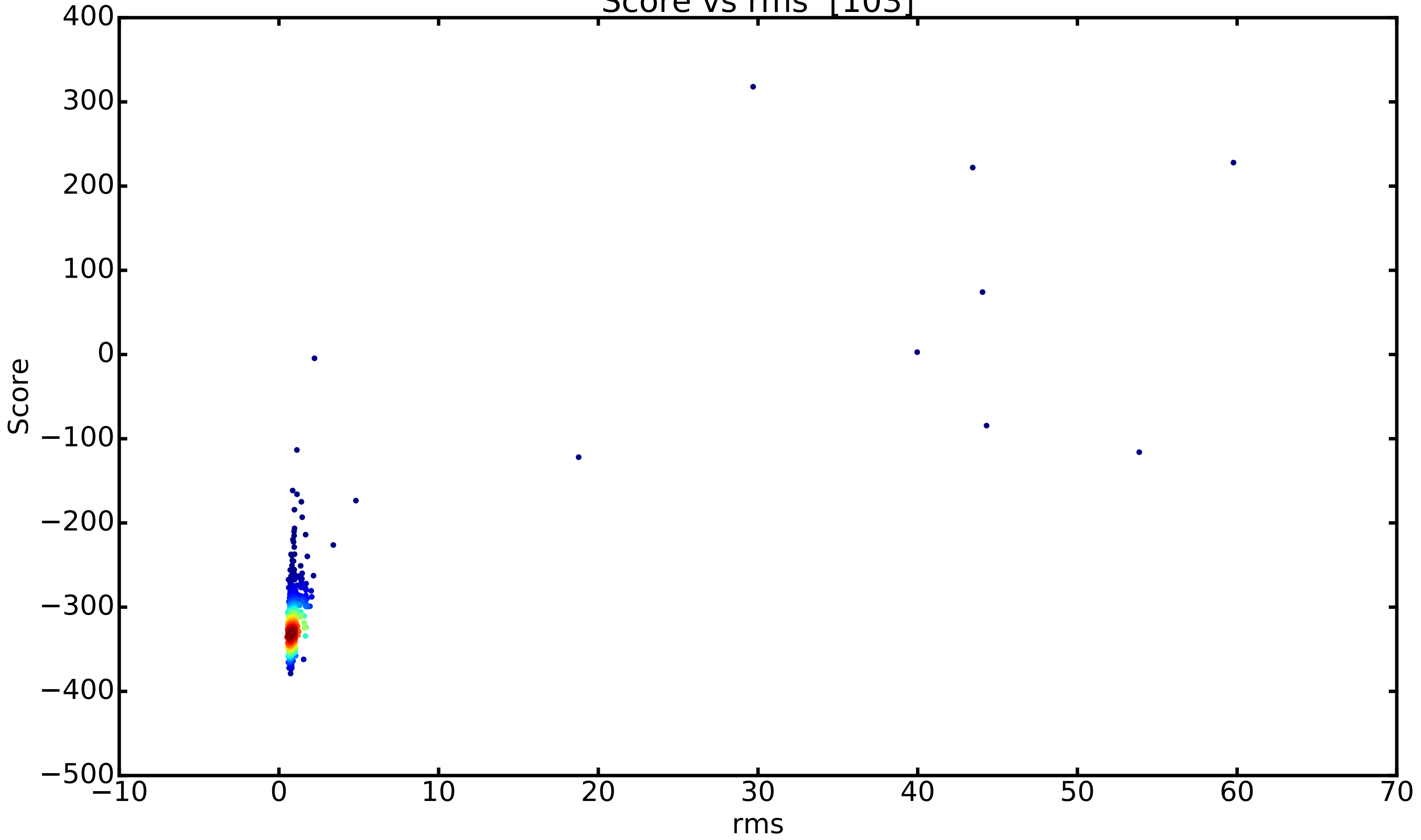
Kruskal-Wallis rank sum test
 Dunn's Test pairwise comparisons
 p-value = 0.05

	emcd106	emcd113	emcd116	emcd134	emcd138	emcd139	emcd154	emcd157	emcd160	
emcd106		<0.0001	<0.0001	<0.0001	<0.0001	0.1914	<0.0001	<0.0001	<0.0001	Combine Score
emcd113	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0018	
emcd116	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	0.43721	0.0414	
emcd134	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
emcd138	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	
emcd139	0.1914	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	
emcd154	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	
emcd157	<0.0001	<0.0001	0.43721	<0.0001	<0.0001	<0.0001	<0.0001		0.0575	
emcd160	<0.0001	0.0018	0.0414	<0.0001	<0.0001	<0.0001	<0.0001	0.0575		

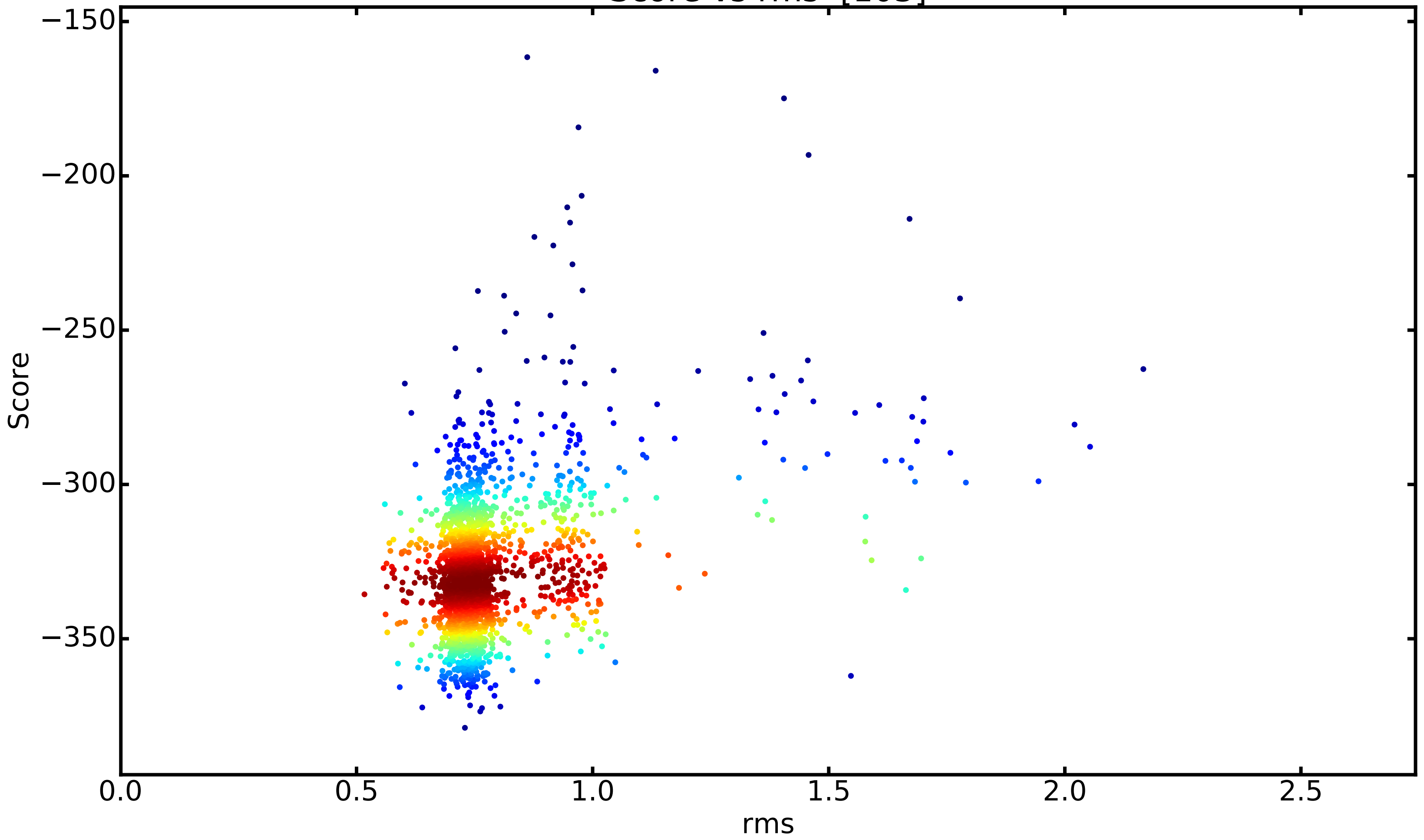
	emcd106	emcd113	emcd116	emcd134	emcd138	emcd139	emcd154	emcd157	emcd160	
emcd106		<0.0001	<0.0001	<0.0001	<0.0001	0.3433	<0.0001	<0.0001	<0.0001	Internal RMSD
emcd113	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
emcd116	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
emcd134	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
emcd138	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001	
emcd139	0.3433	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001	
emcd154	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001	
emcd157	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		0.0001	
emcd160	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001		



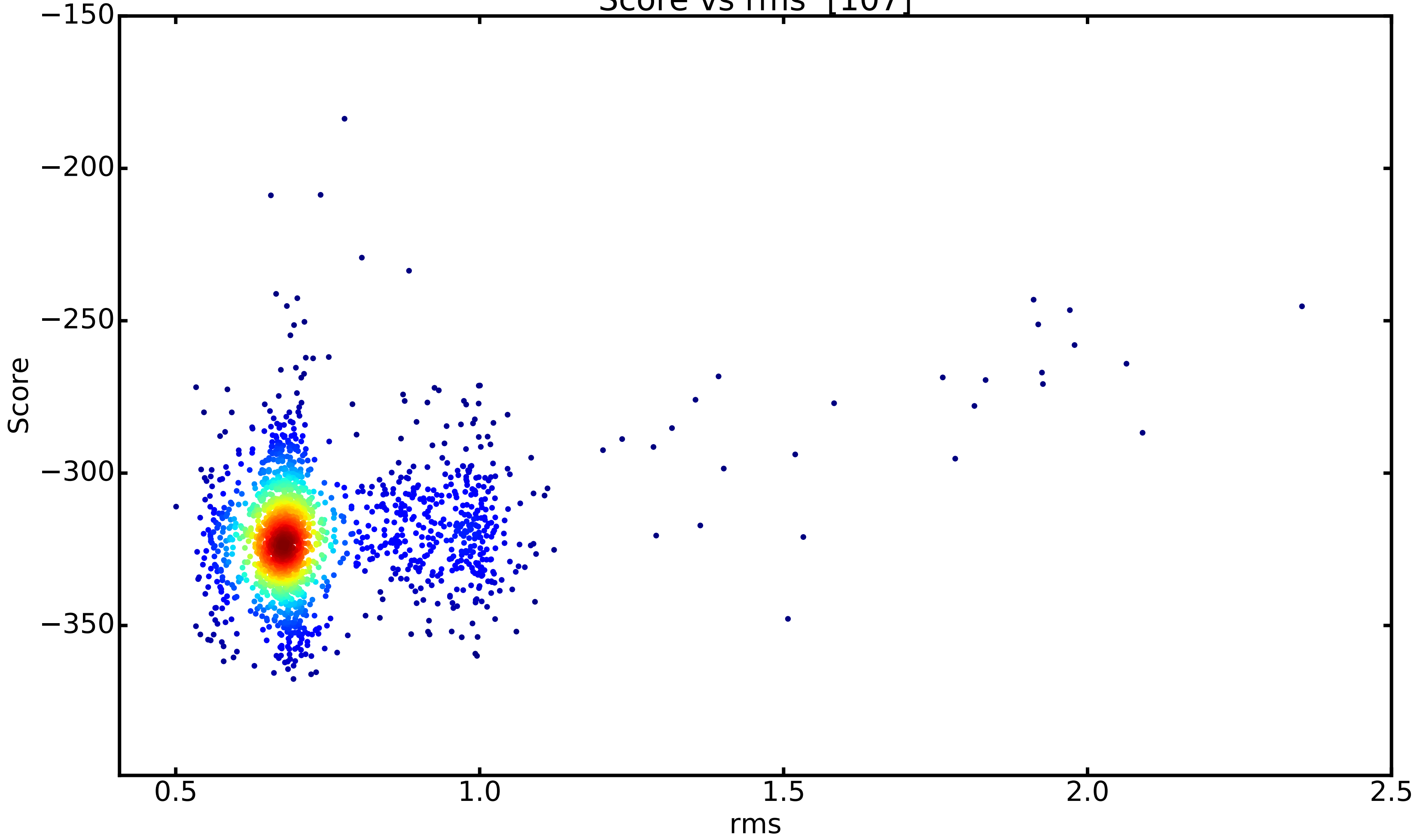
Score vs rms [103]



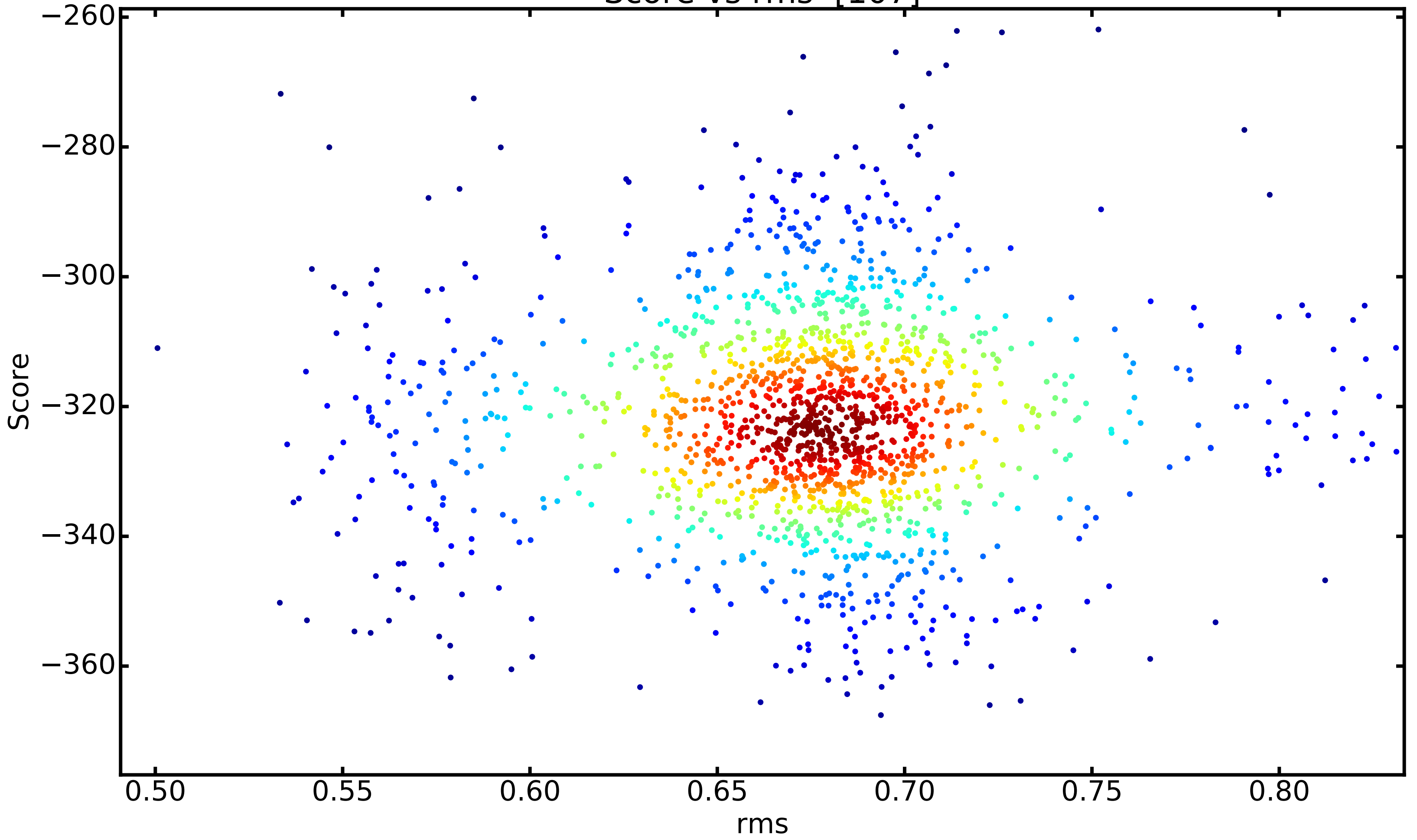
Score vs rms [103]



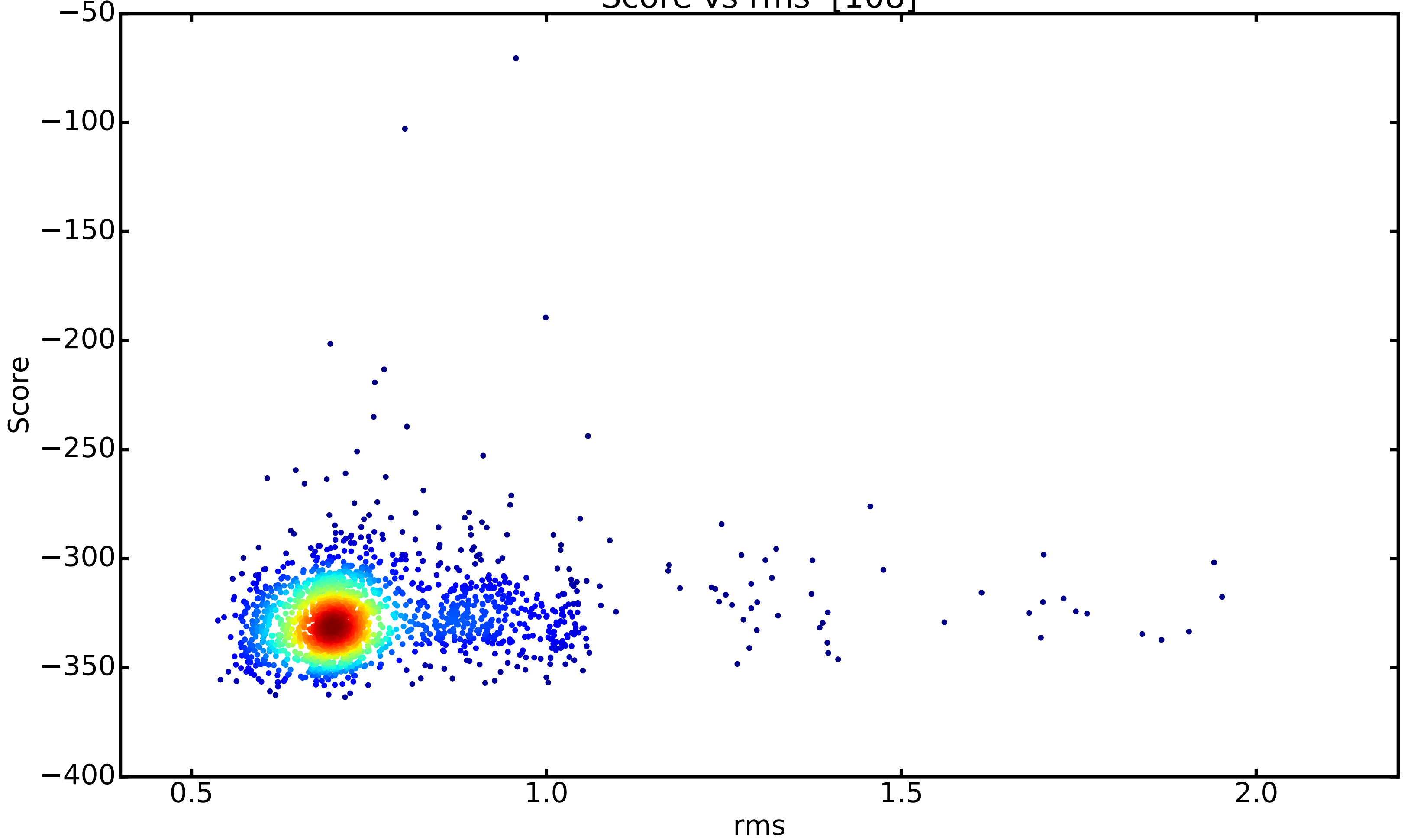
Score vs rms [107]



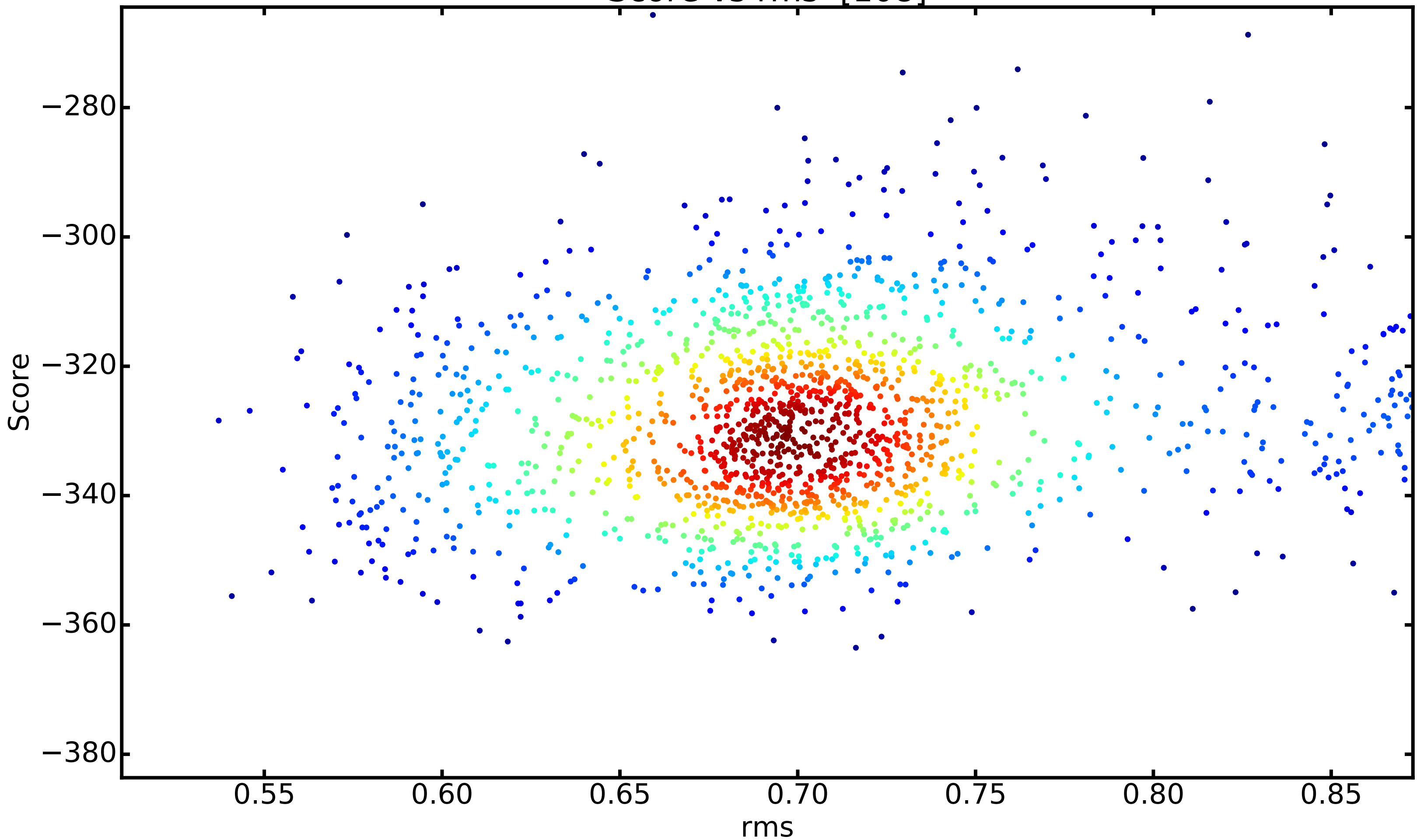
Score vs rms [107]



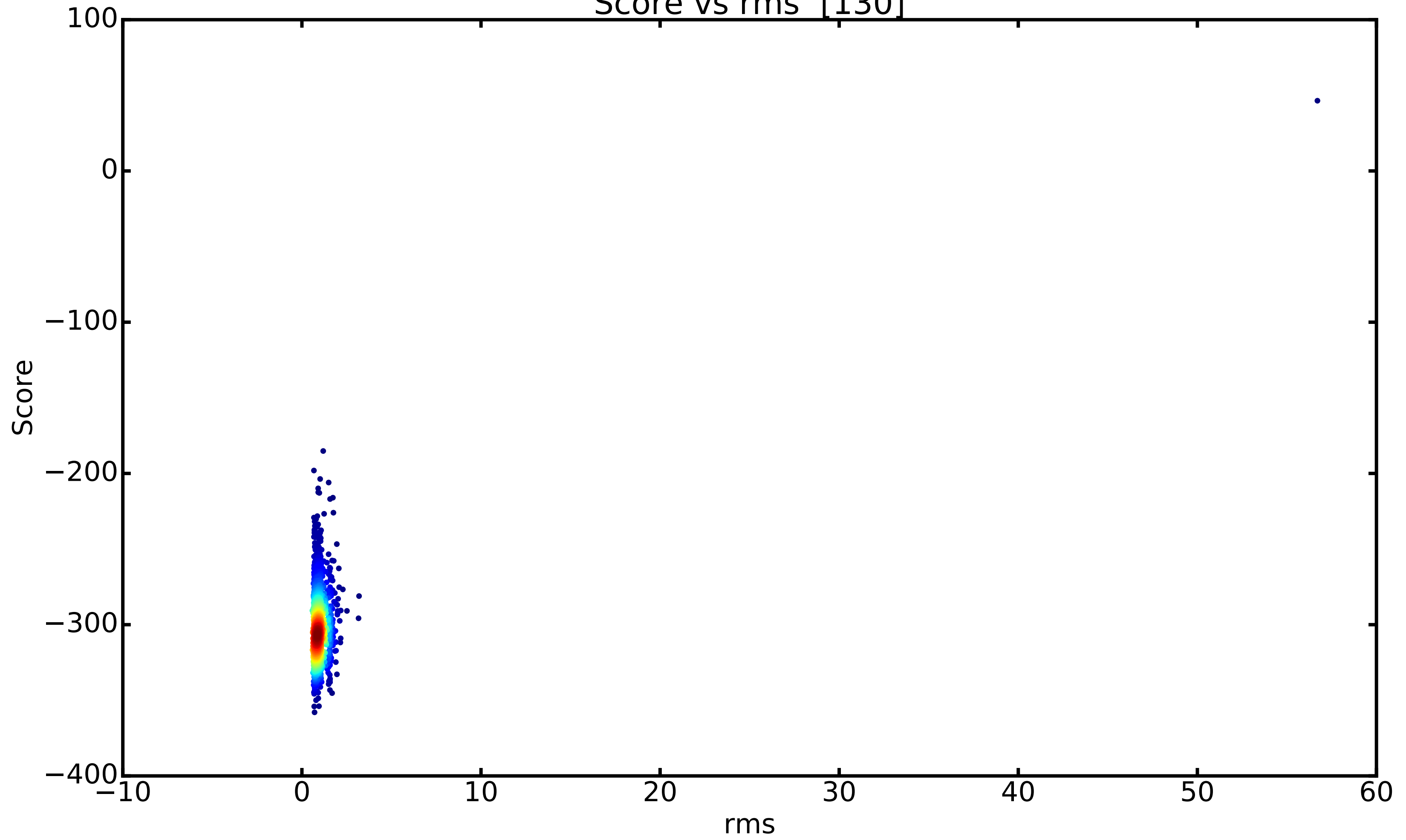
Score vs rms [108]



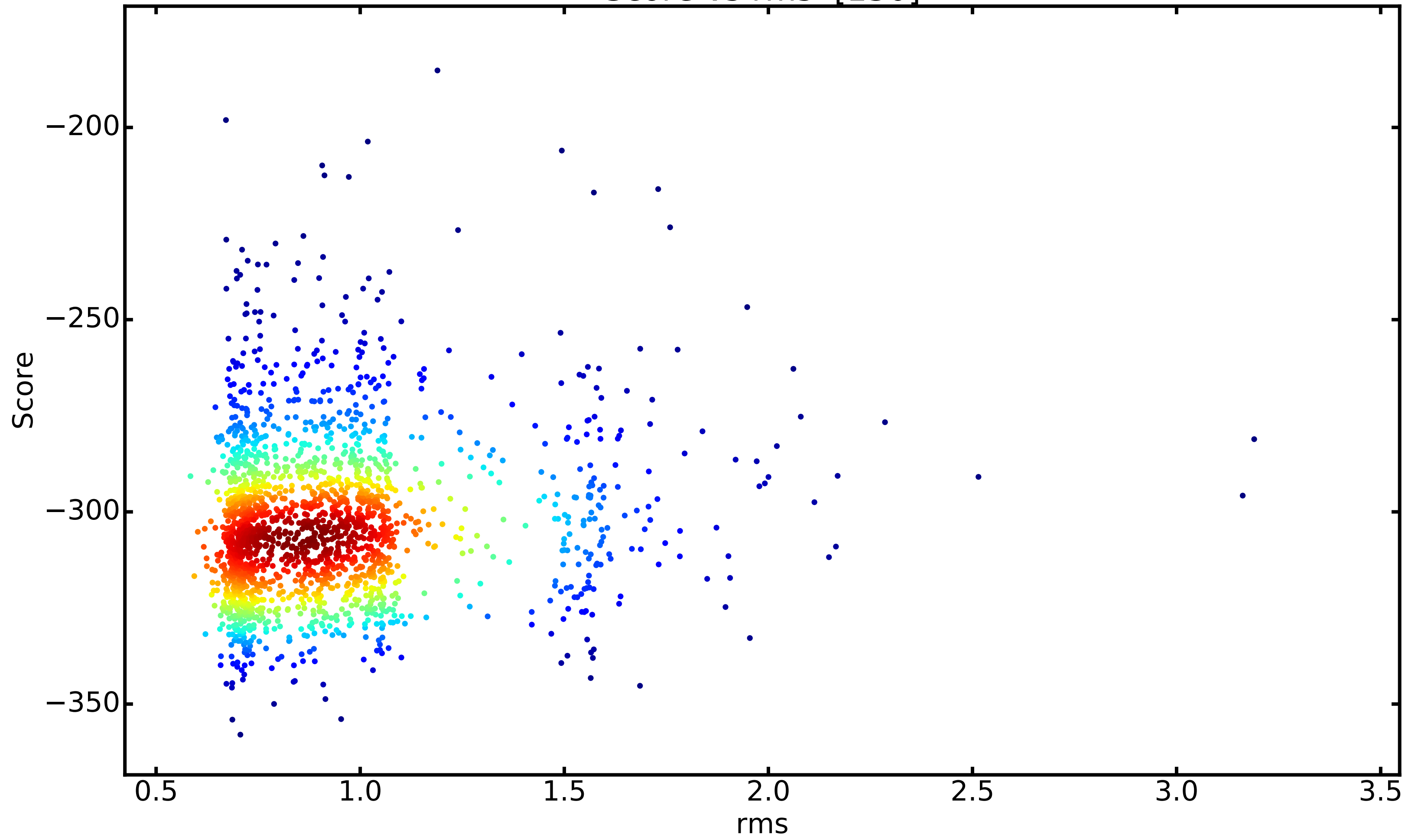
Score vs rms [108]



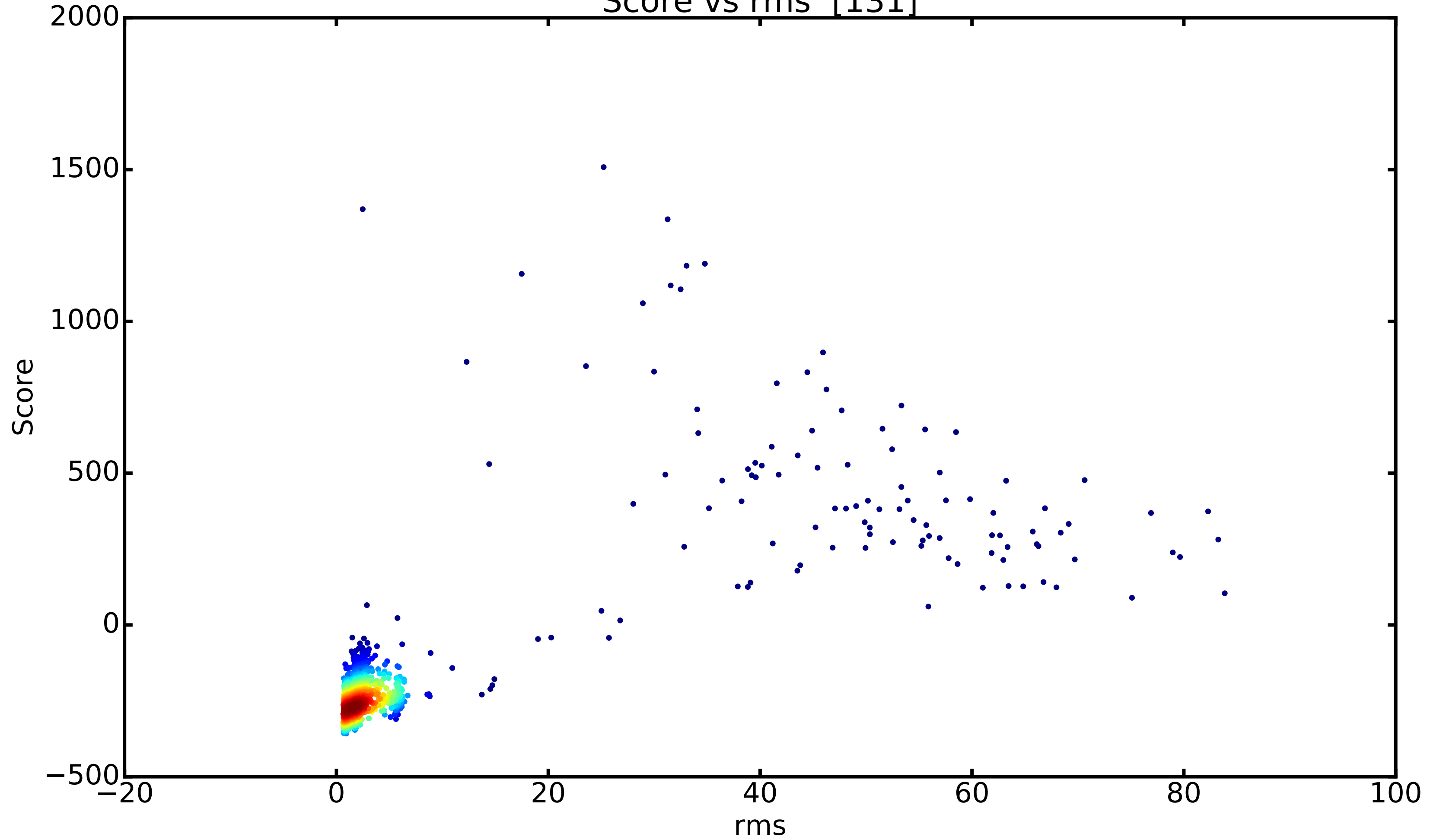
Score vs rms [130]



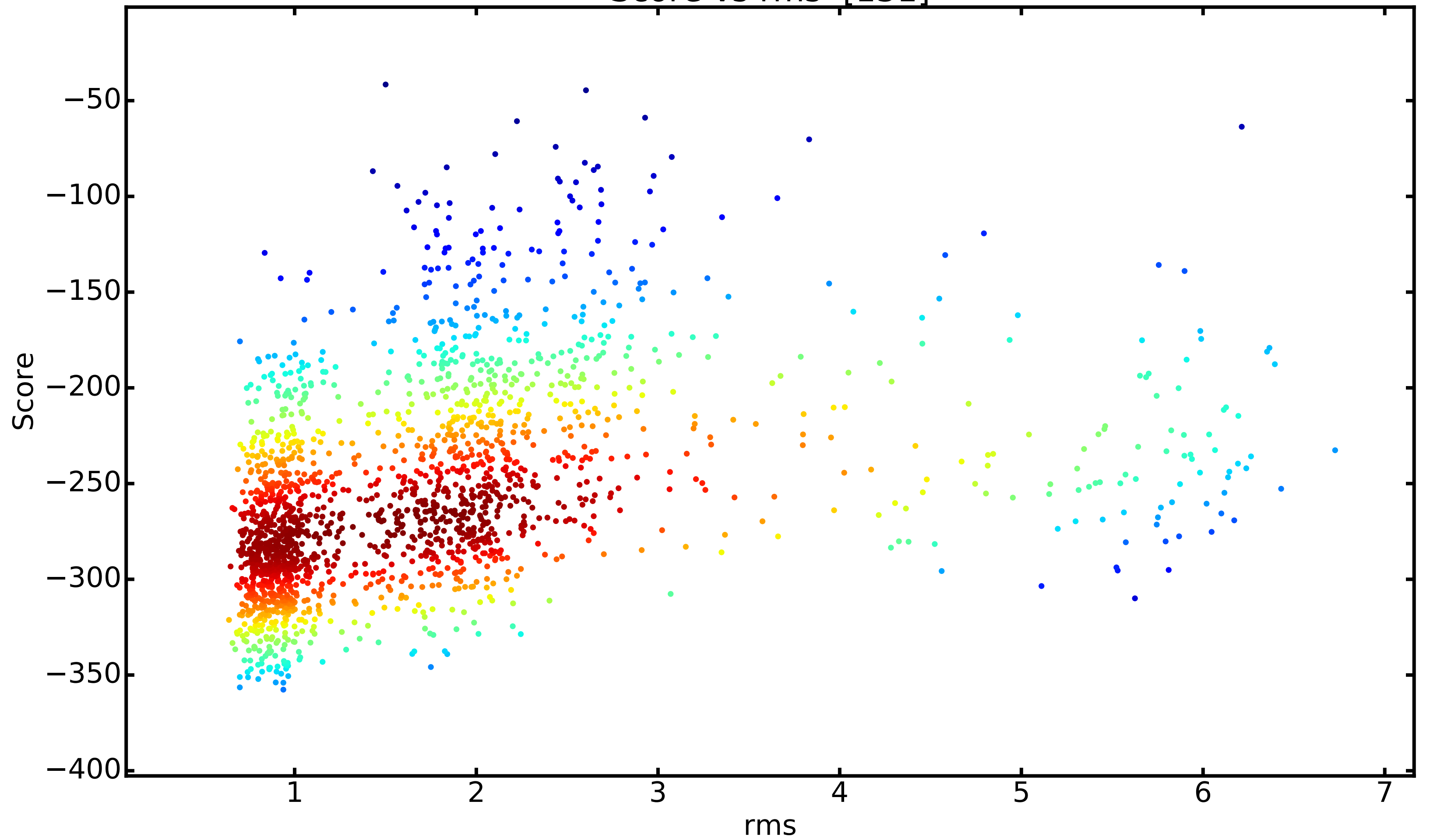
Score vs rms [130]



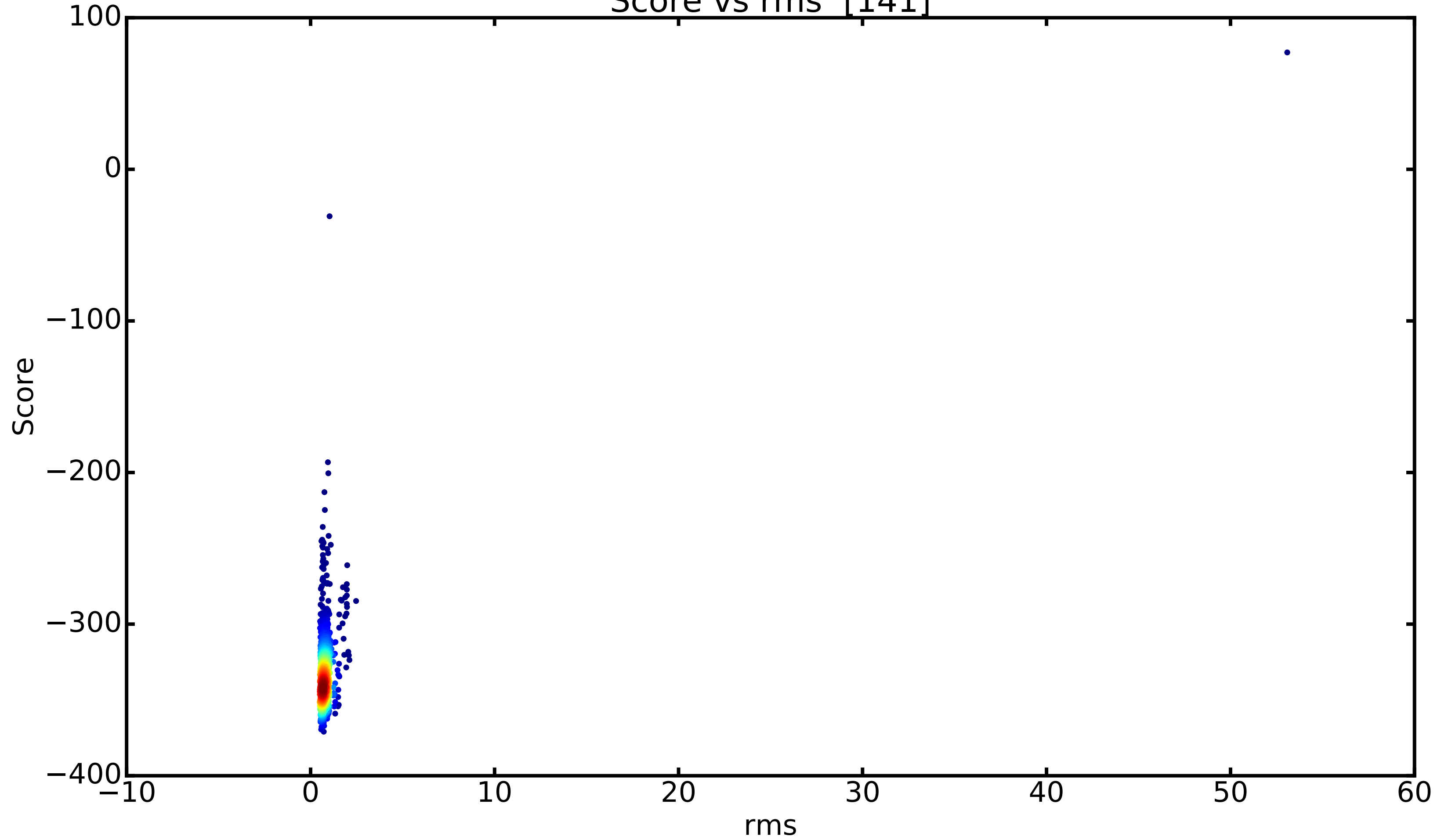
Score vs rms [131]



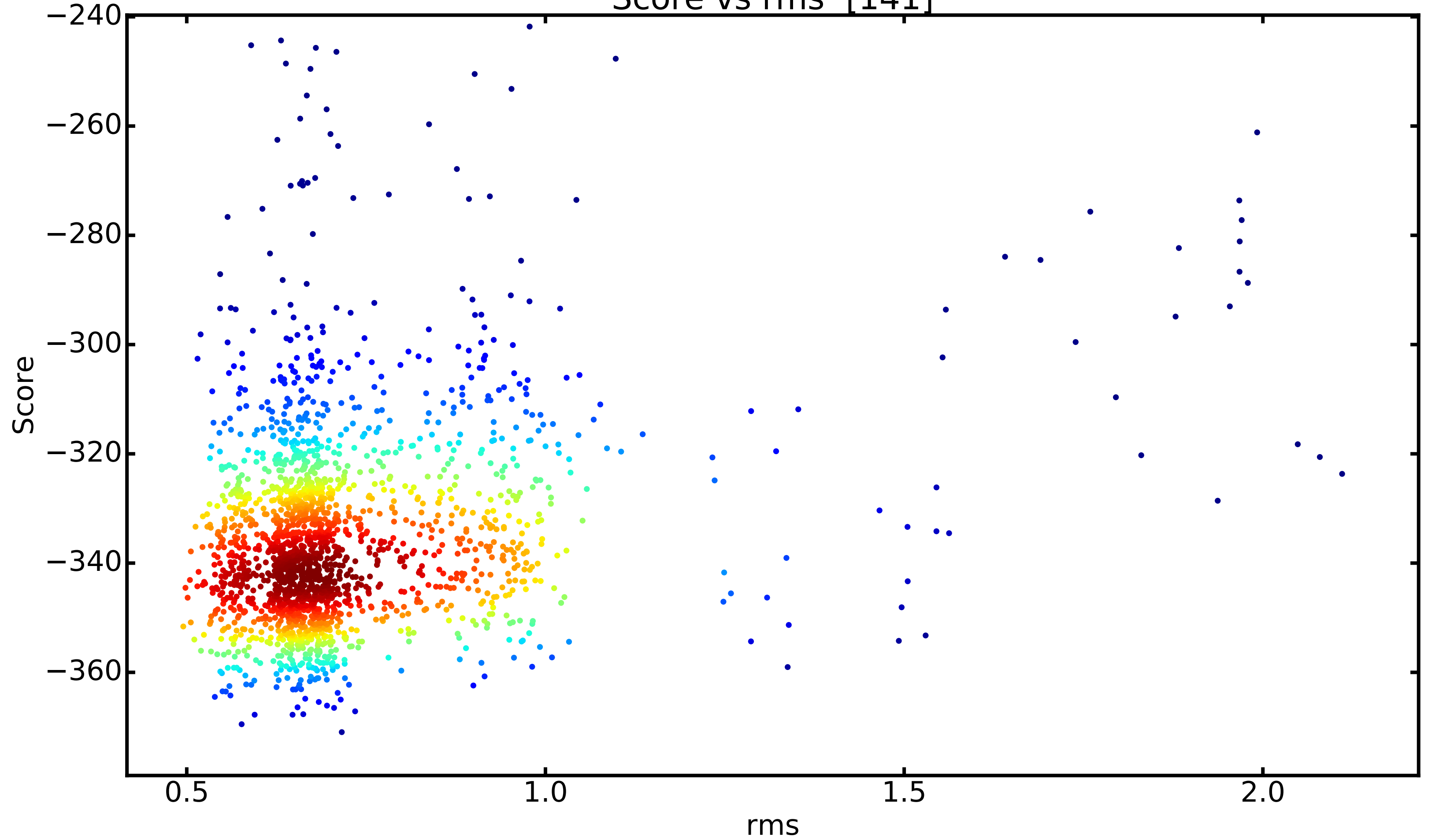
Score vs rms [131]



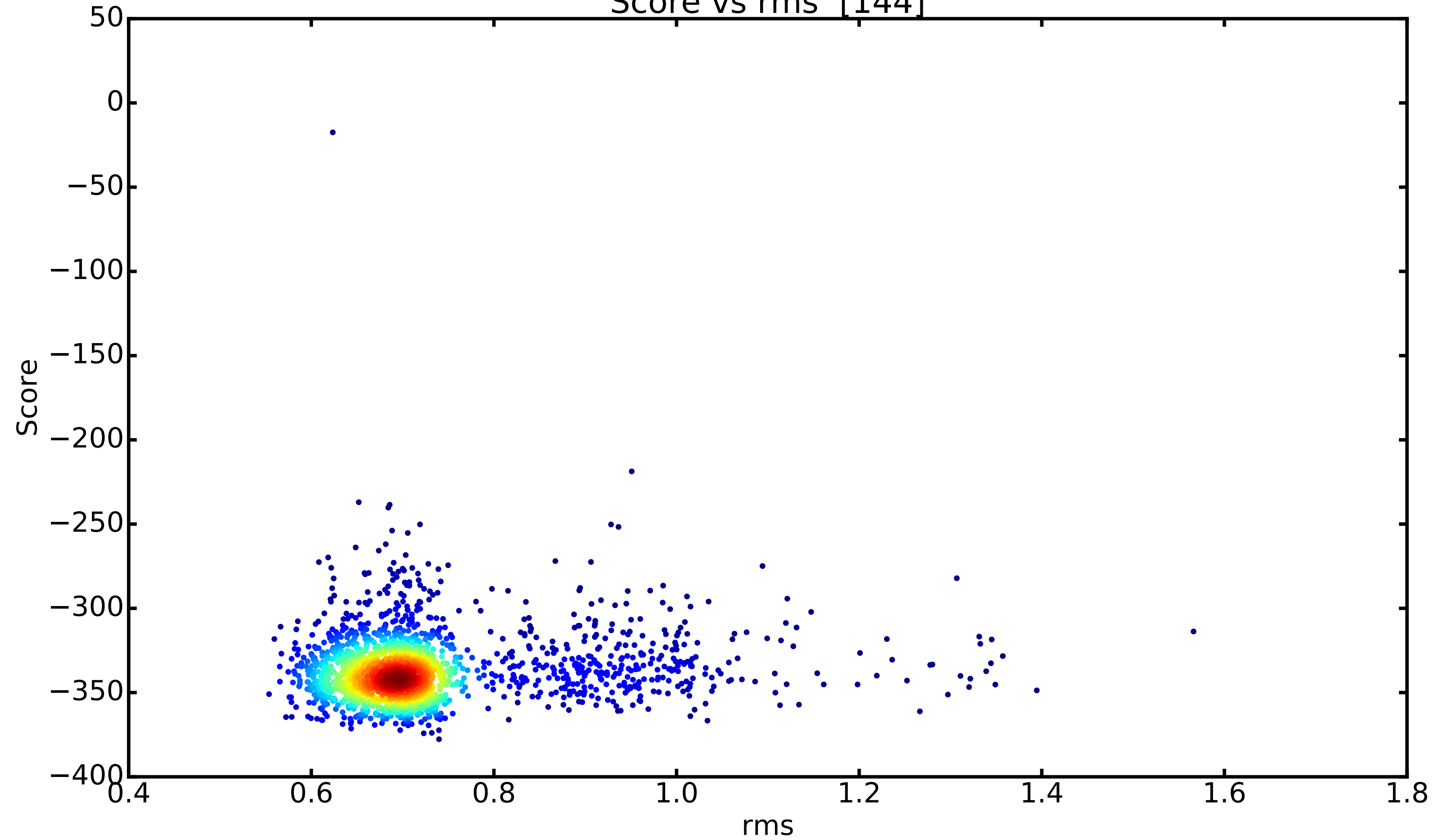
Score vs rms [141]



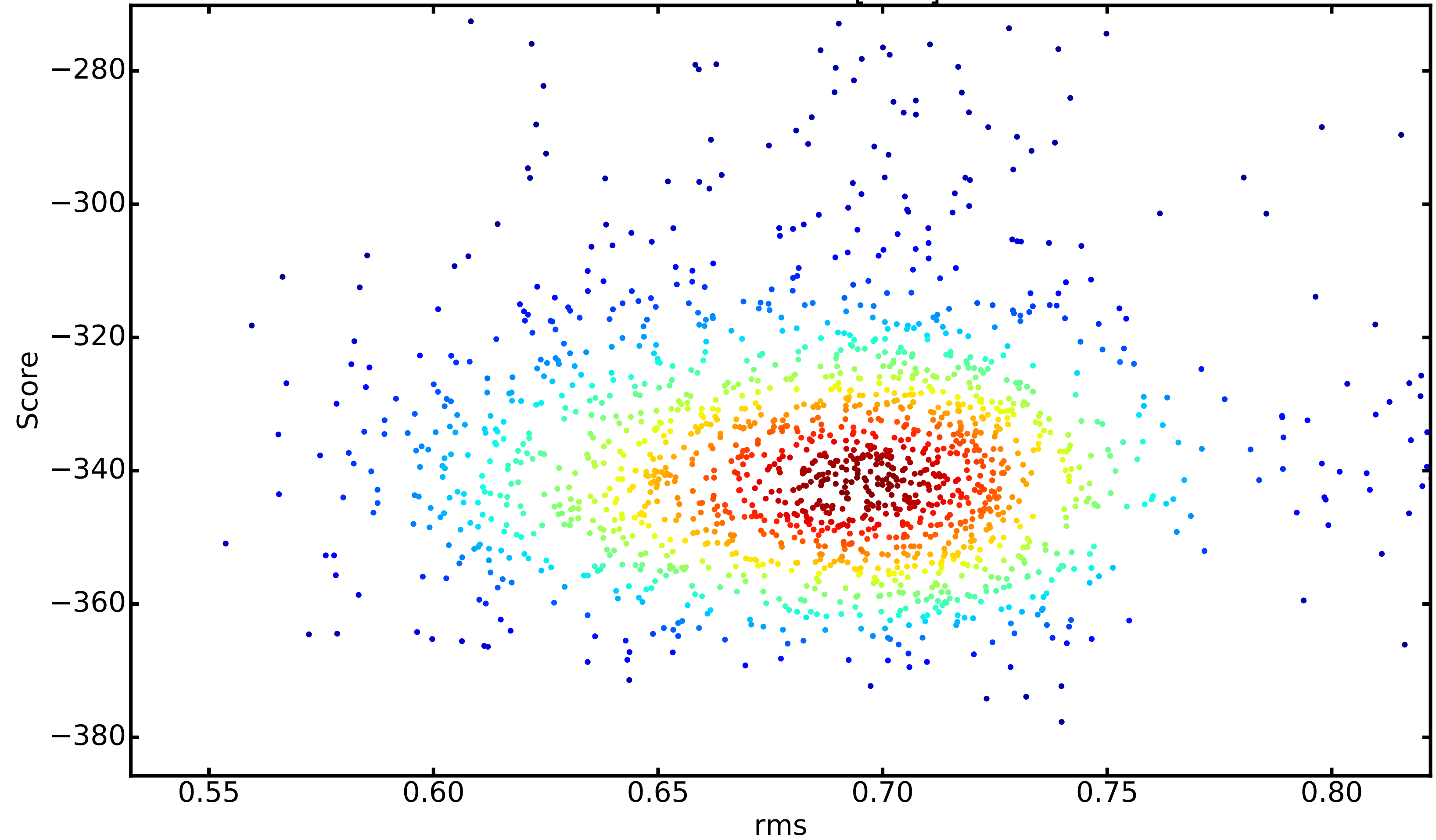
Score vs rms [141]



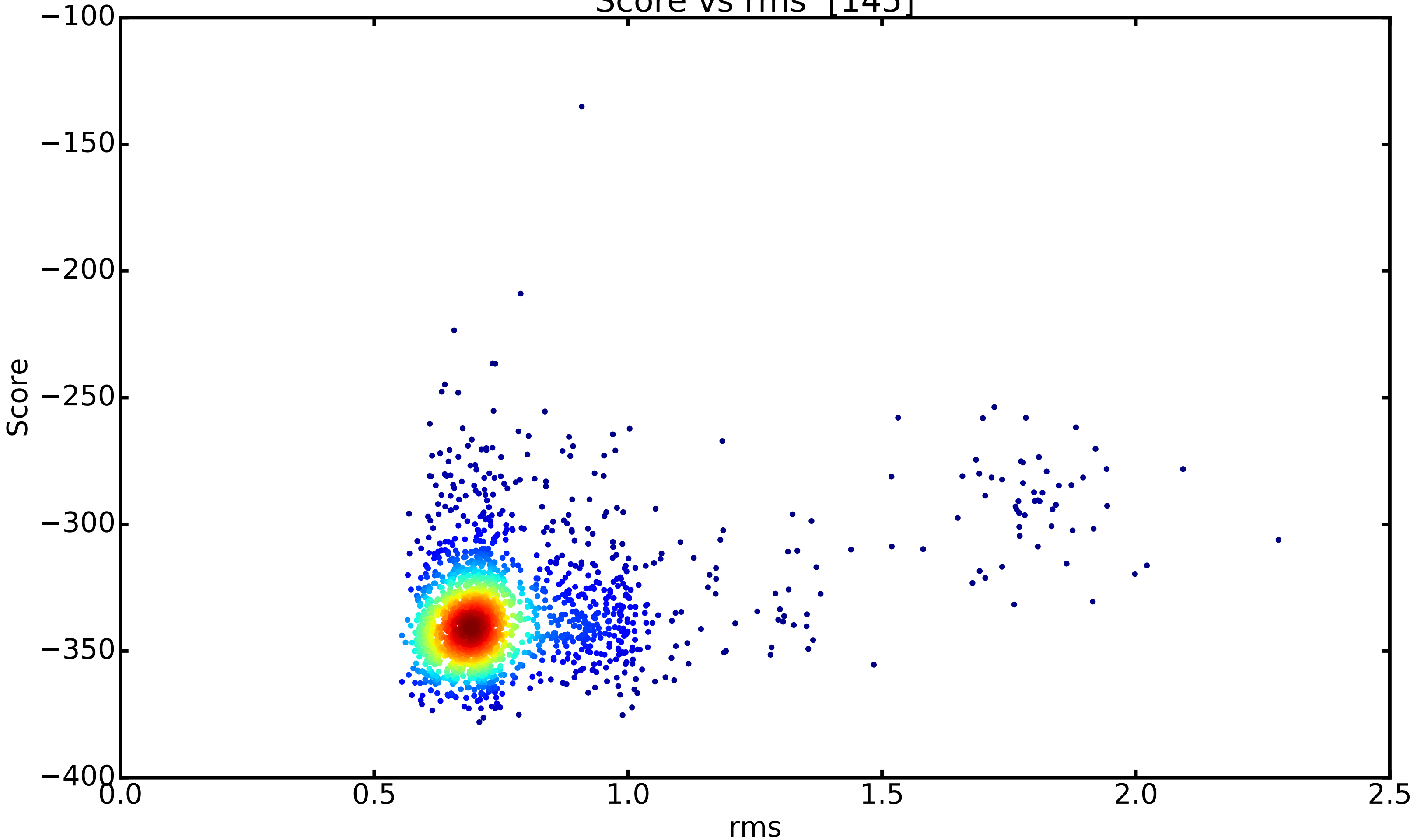
Score vs rms [144]



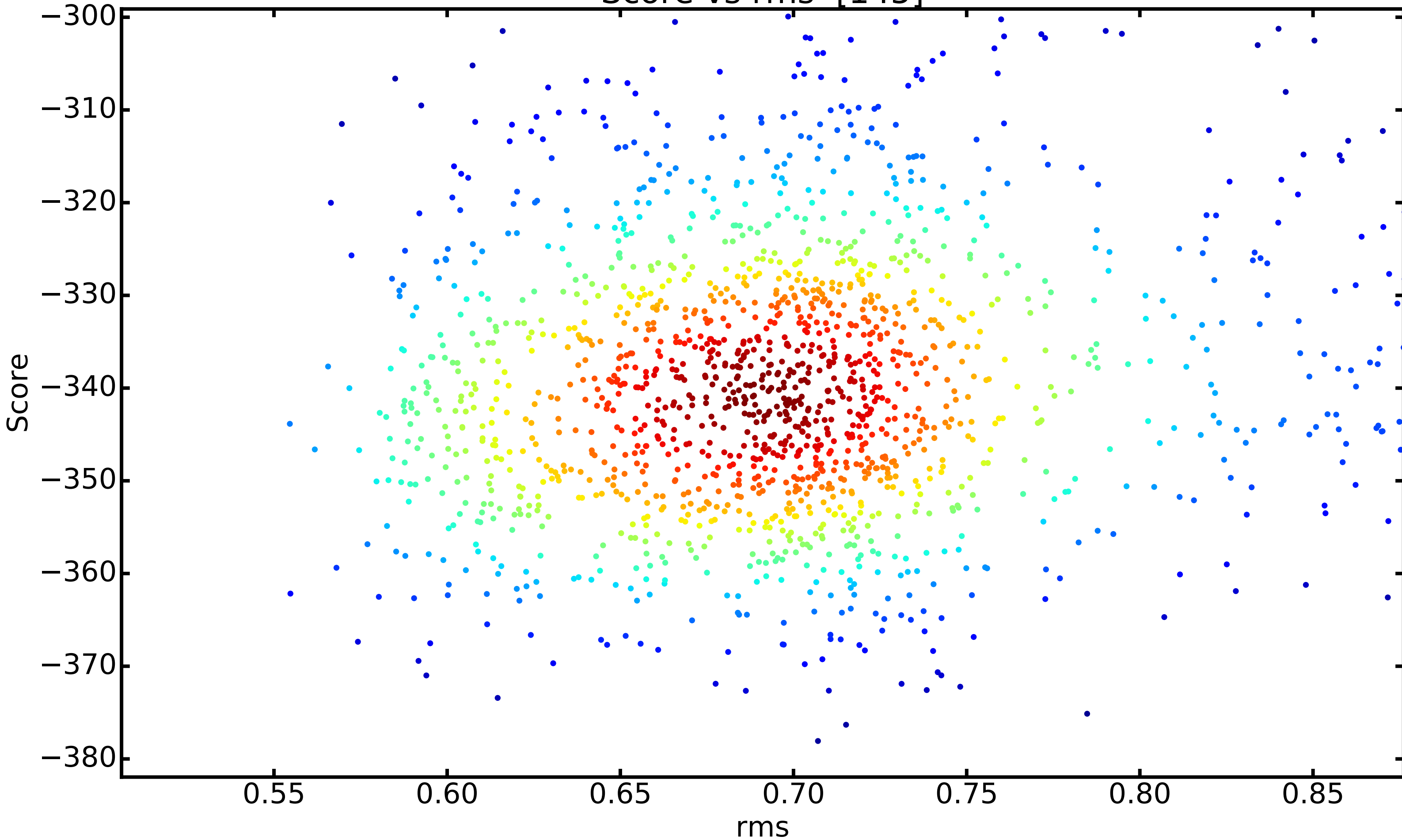
Score vs rms [144]



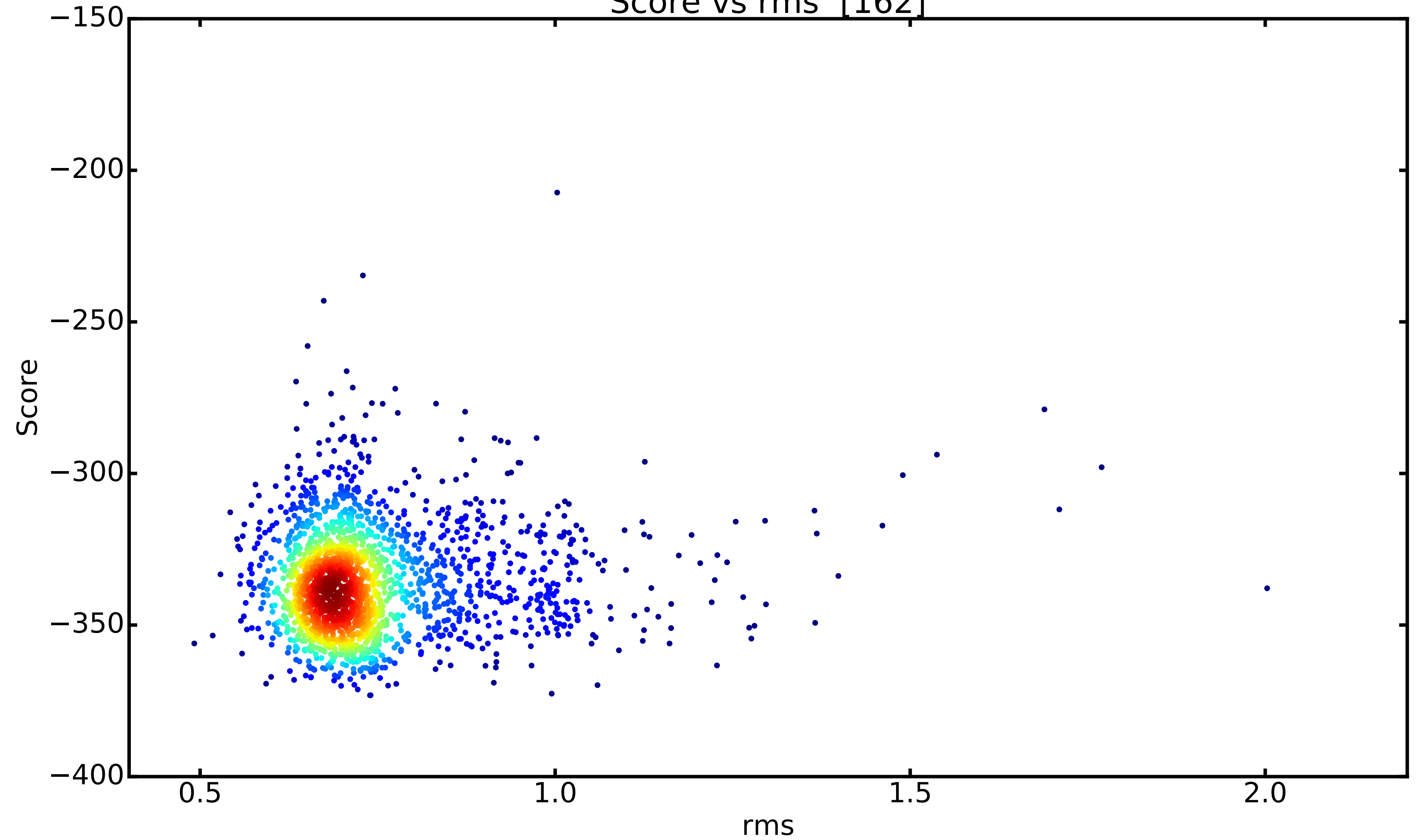
Score vs rms [145]



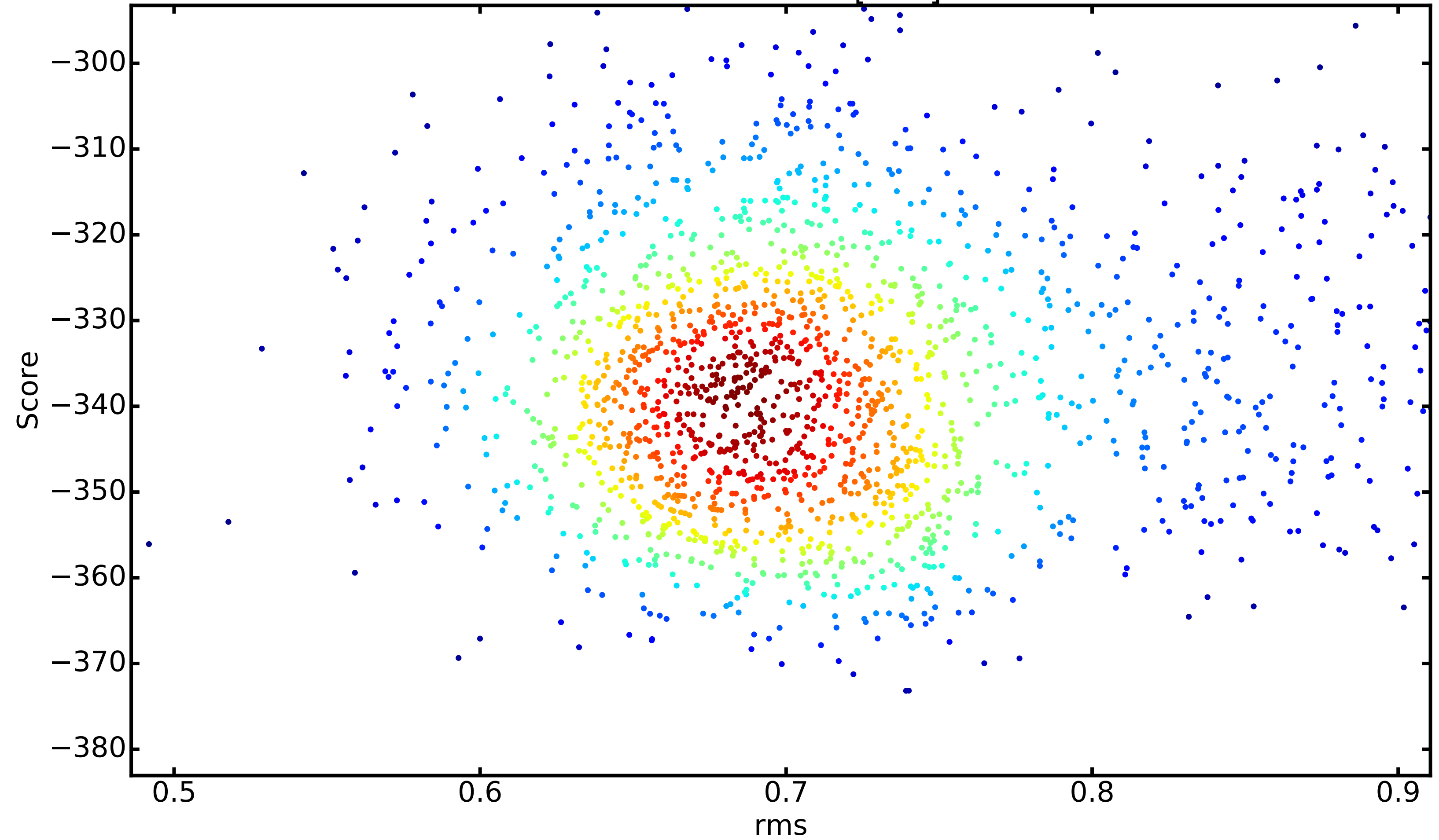
Score vs rms [145]

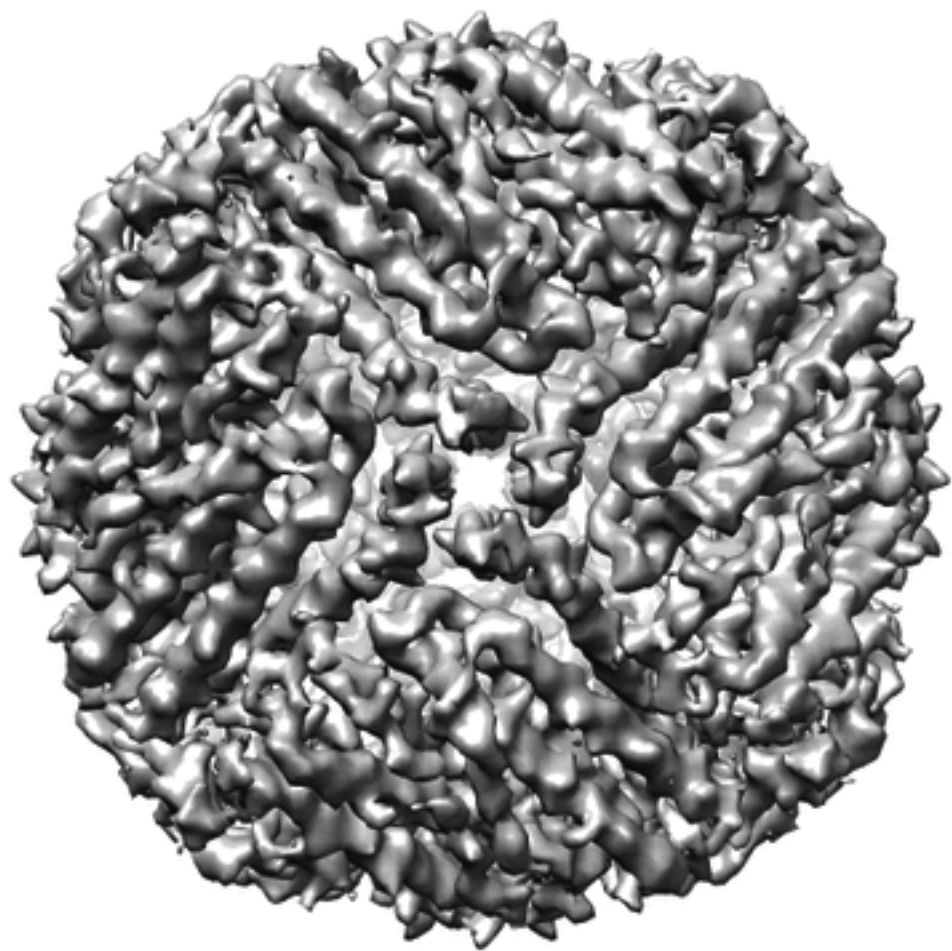


Score vs rms [162]

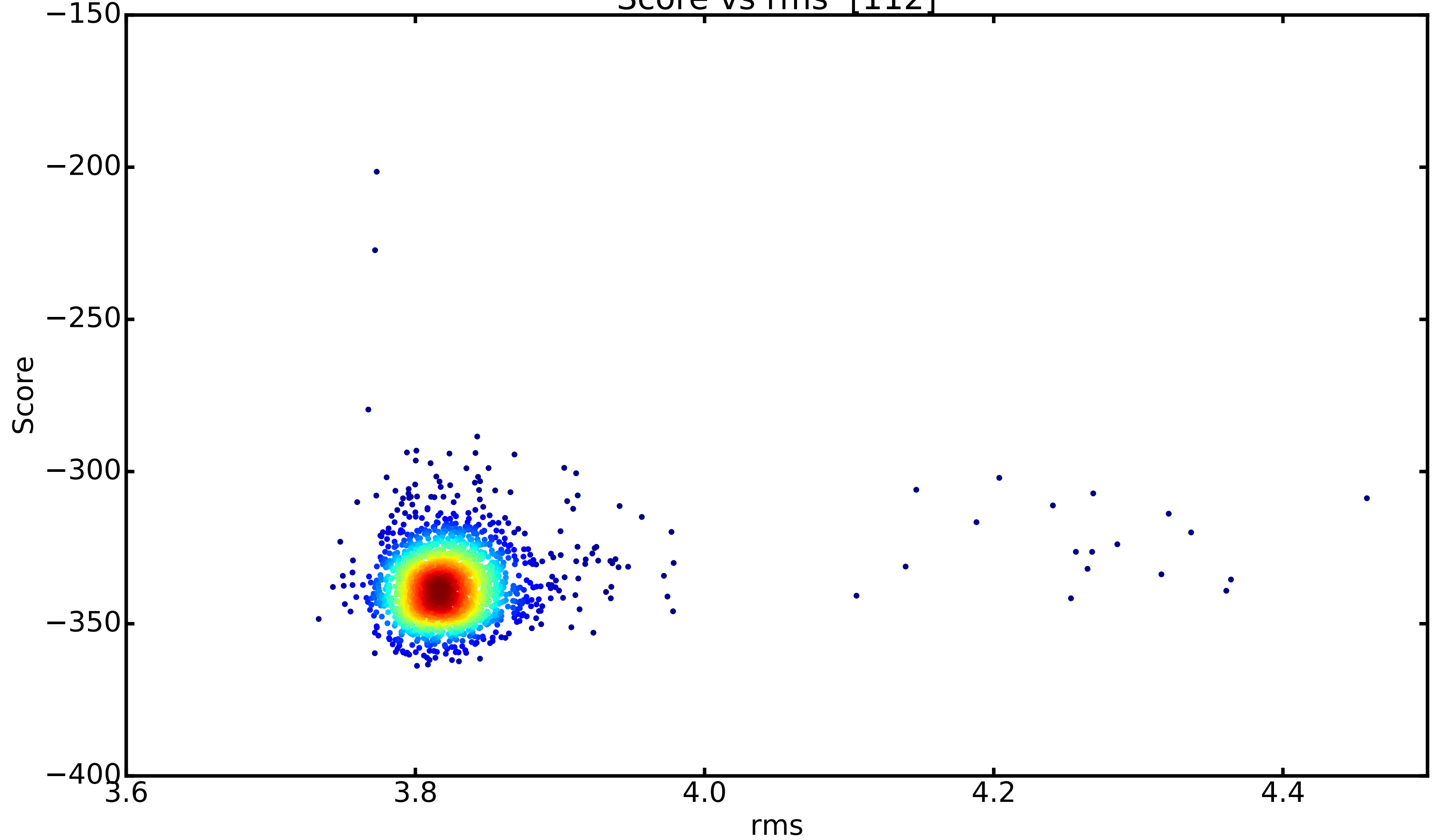


Score vs rms [162]

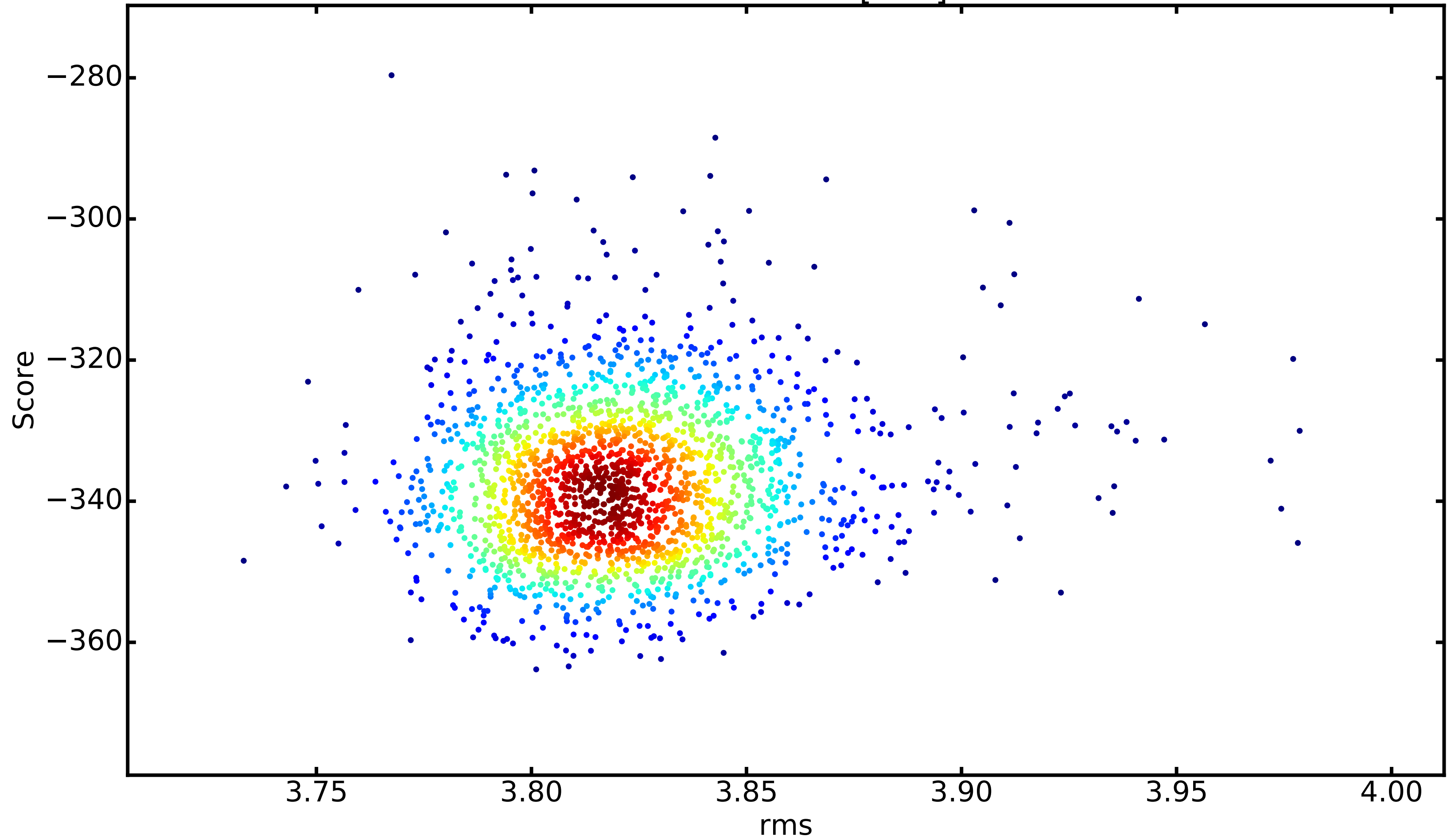




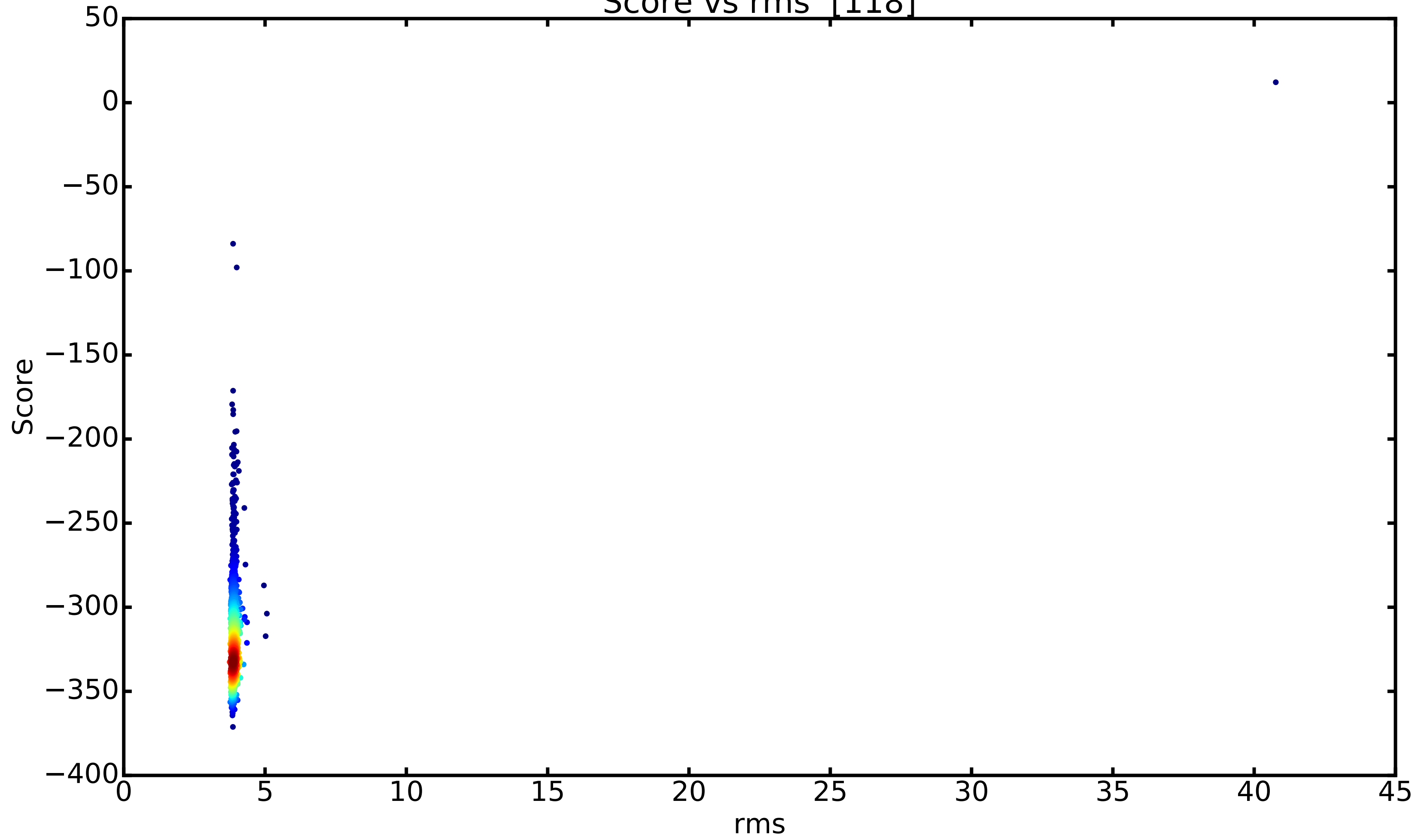
Score vs rms [112]



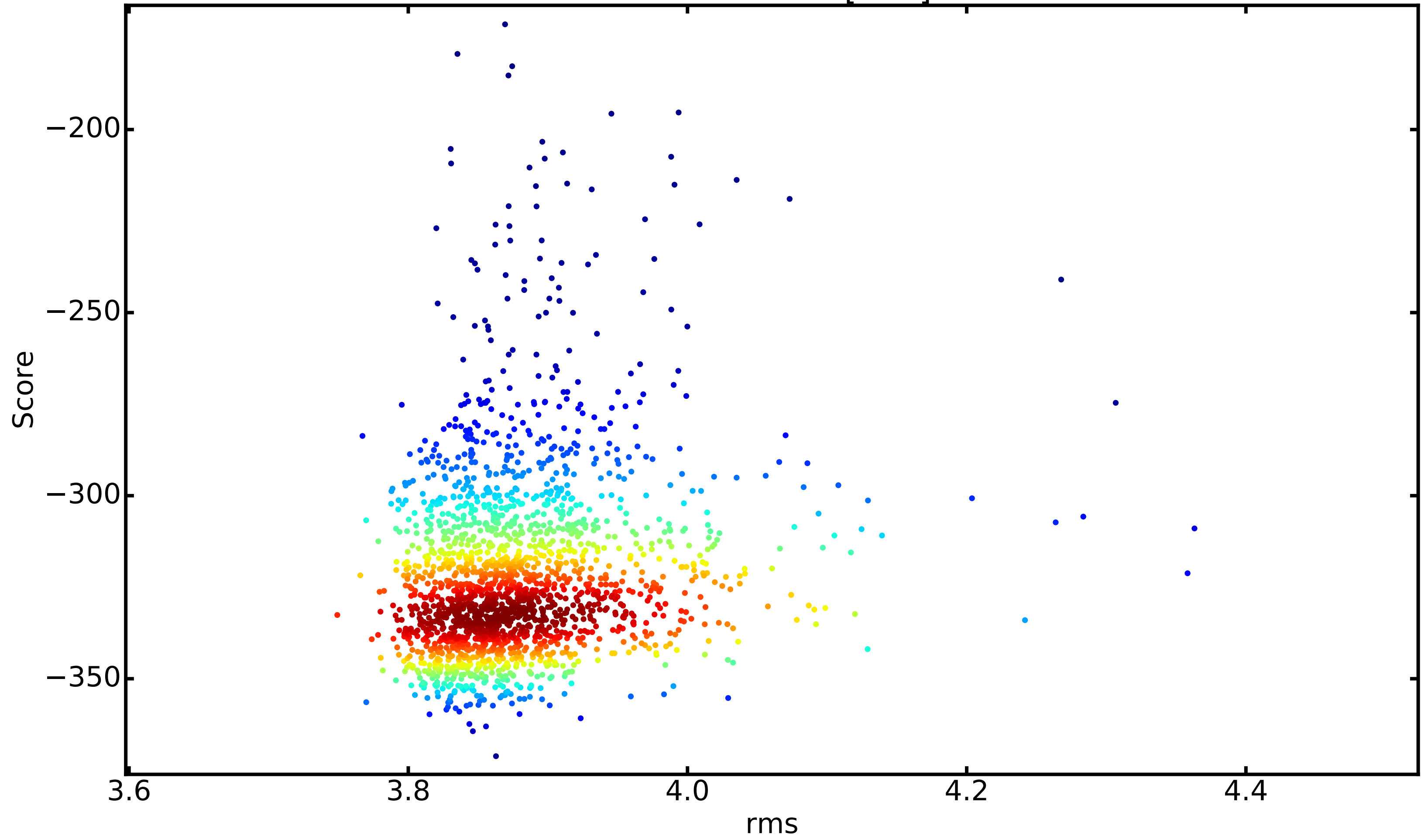
Score vs rms [112]



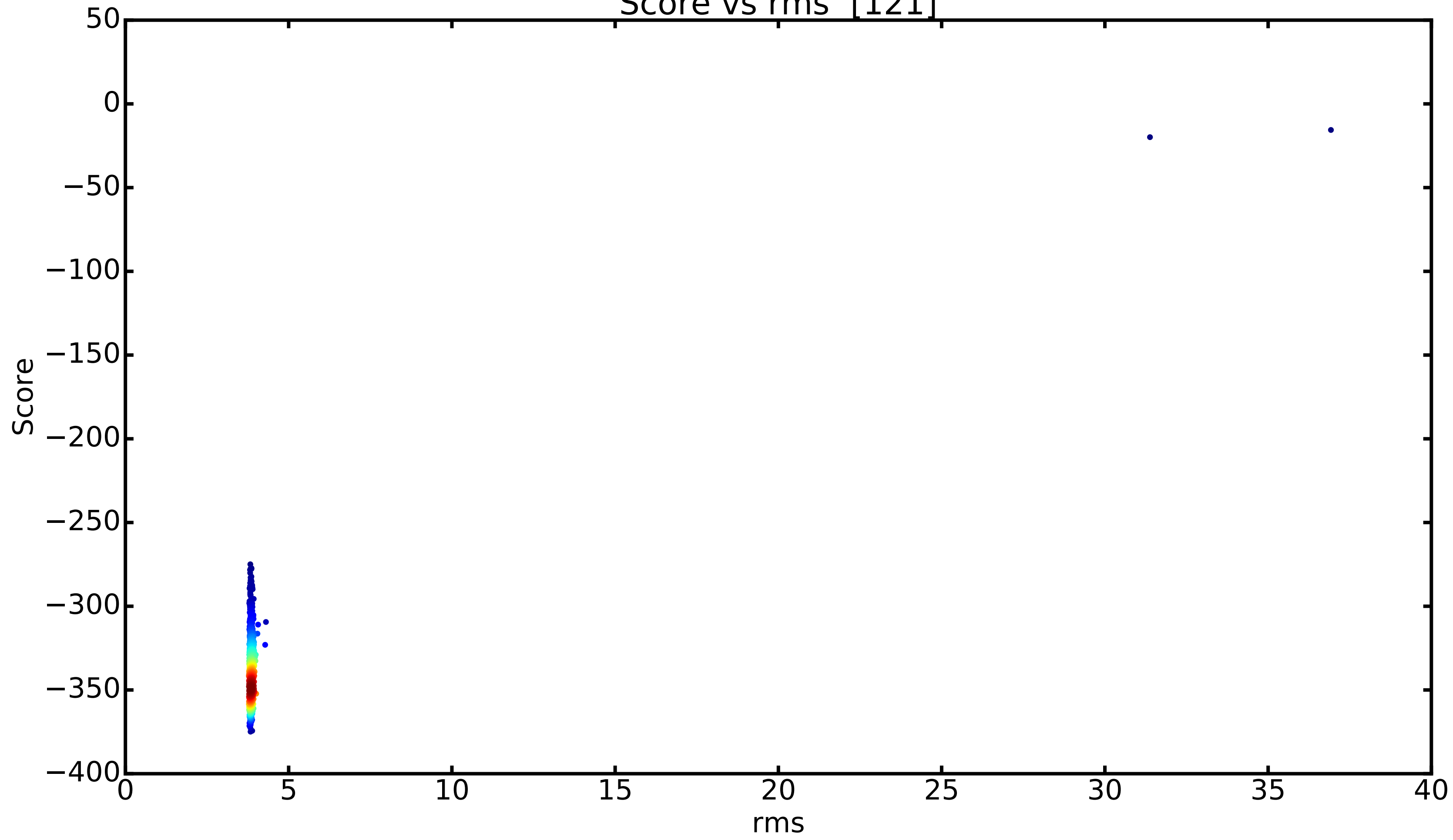
Score vs rms [118]



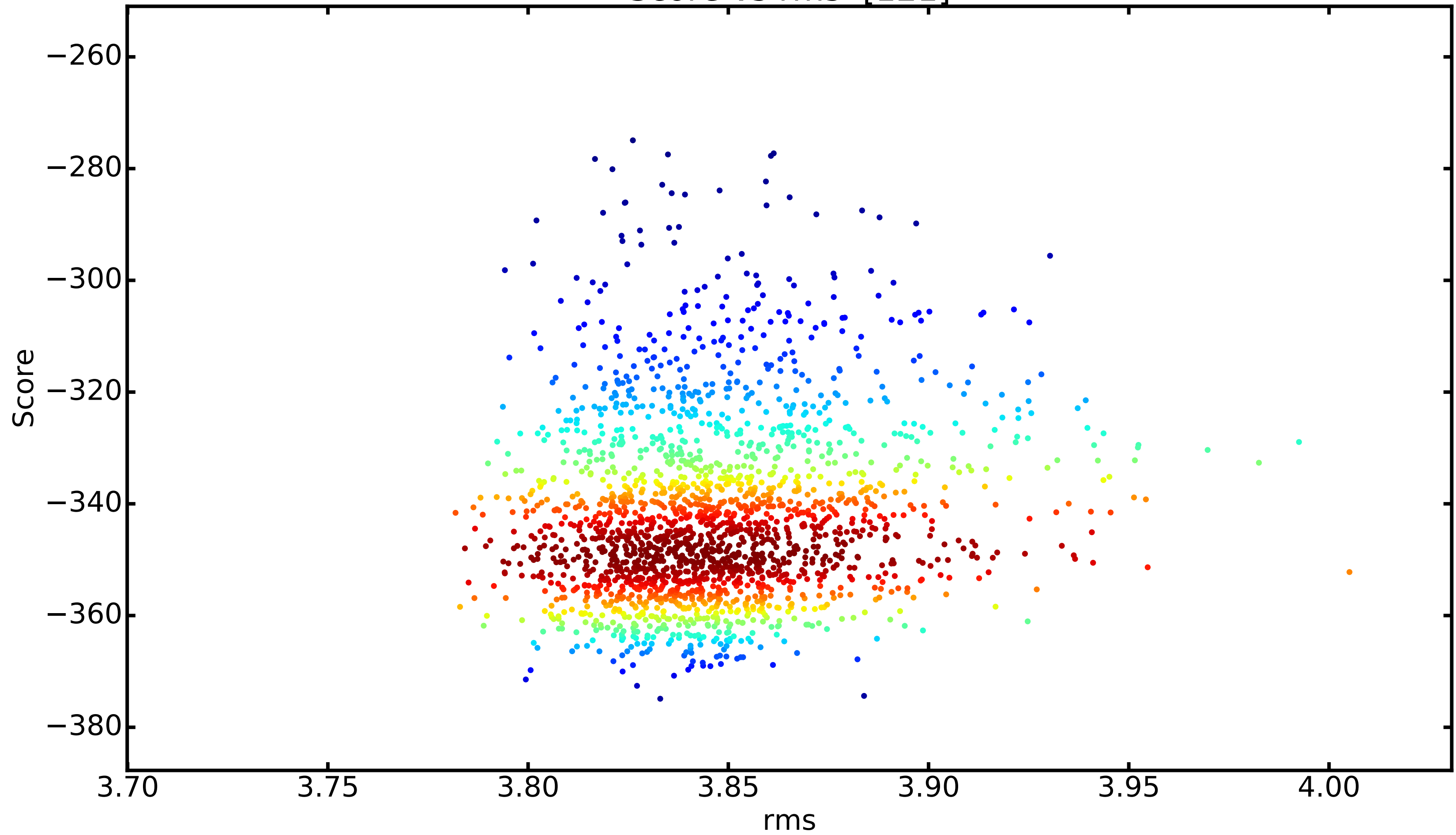
Score vs rms [118]



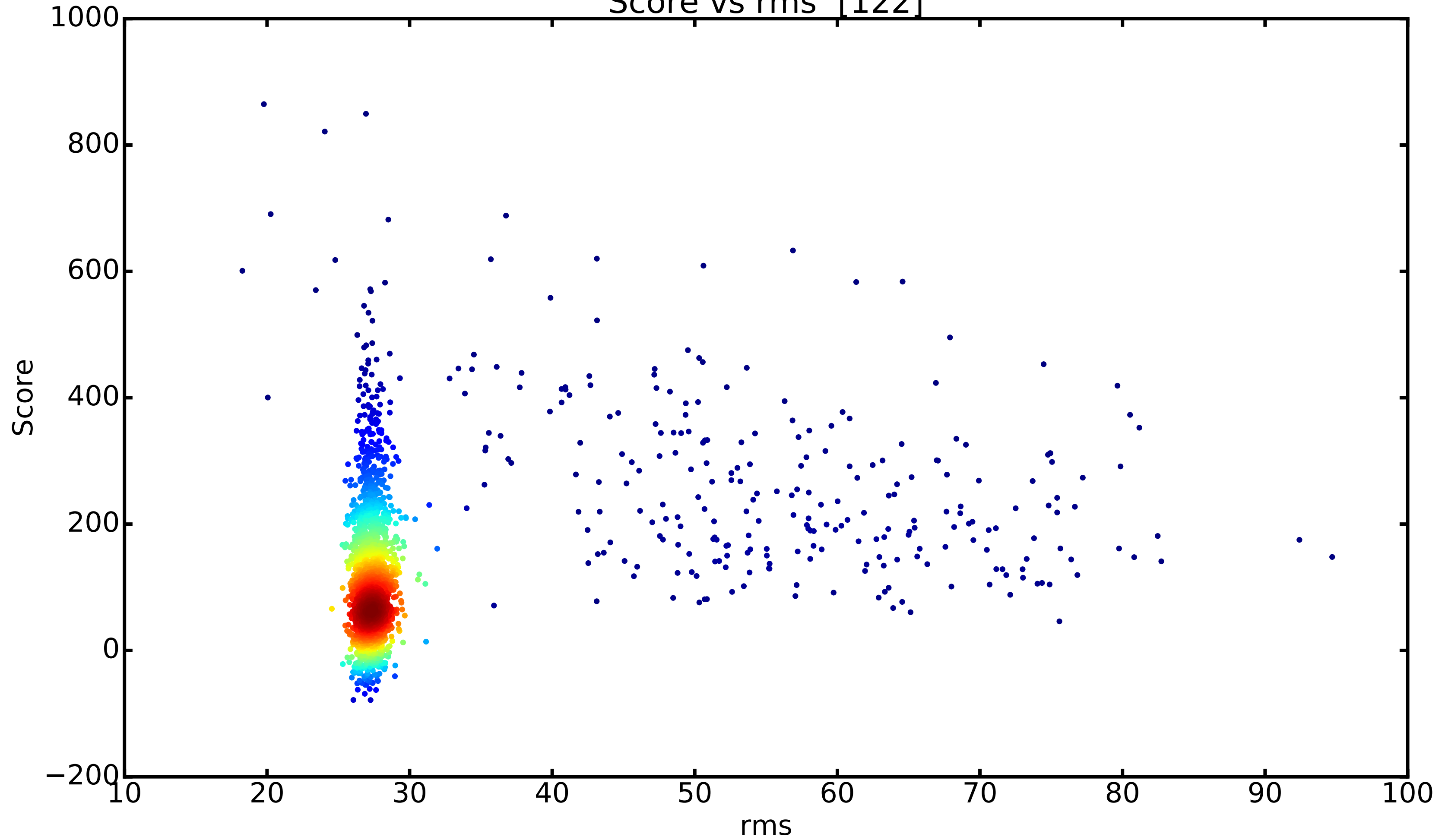
Score vs rms [121]



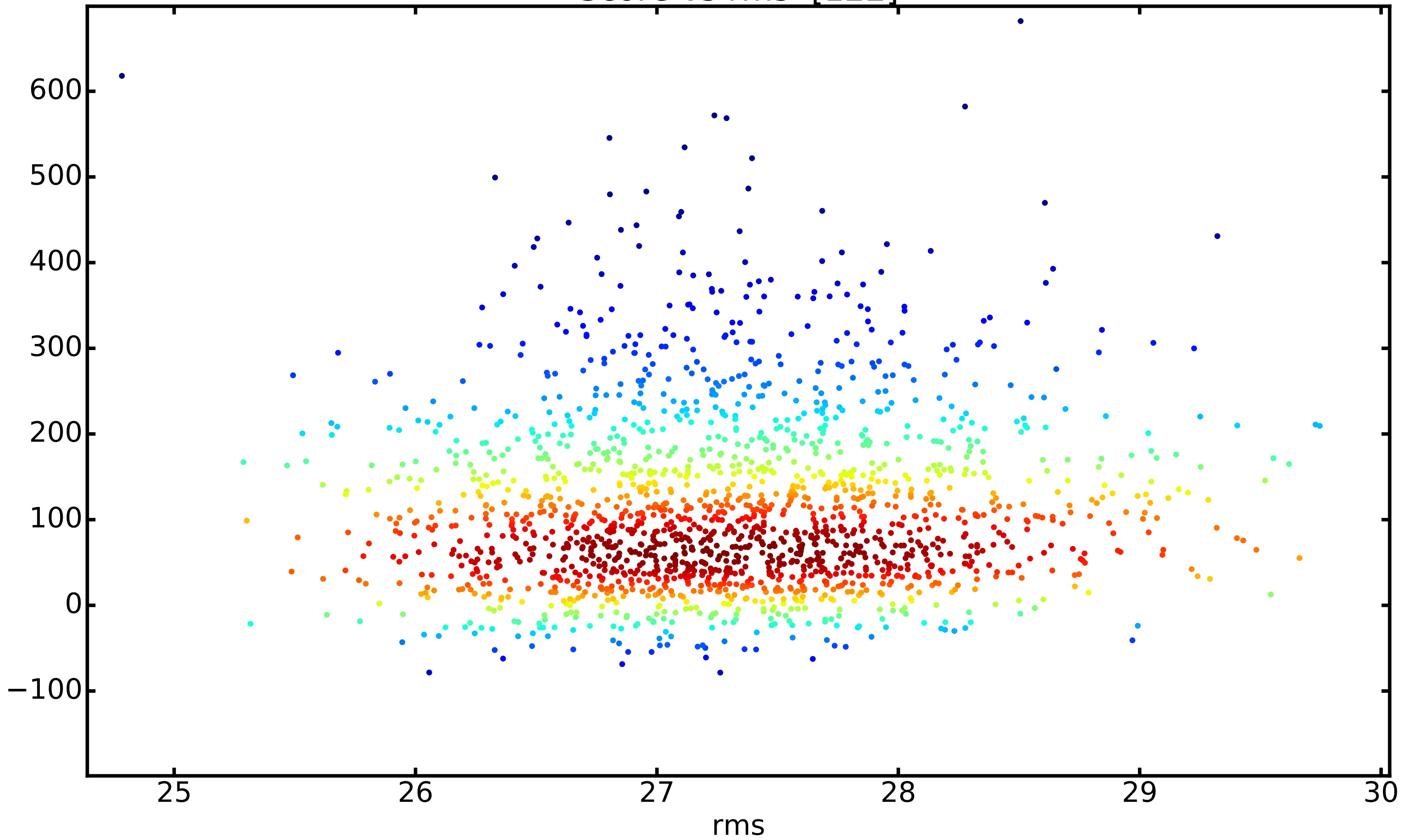
Score vs rms [121]



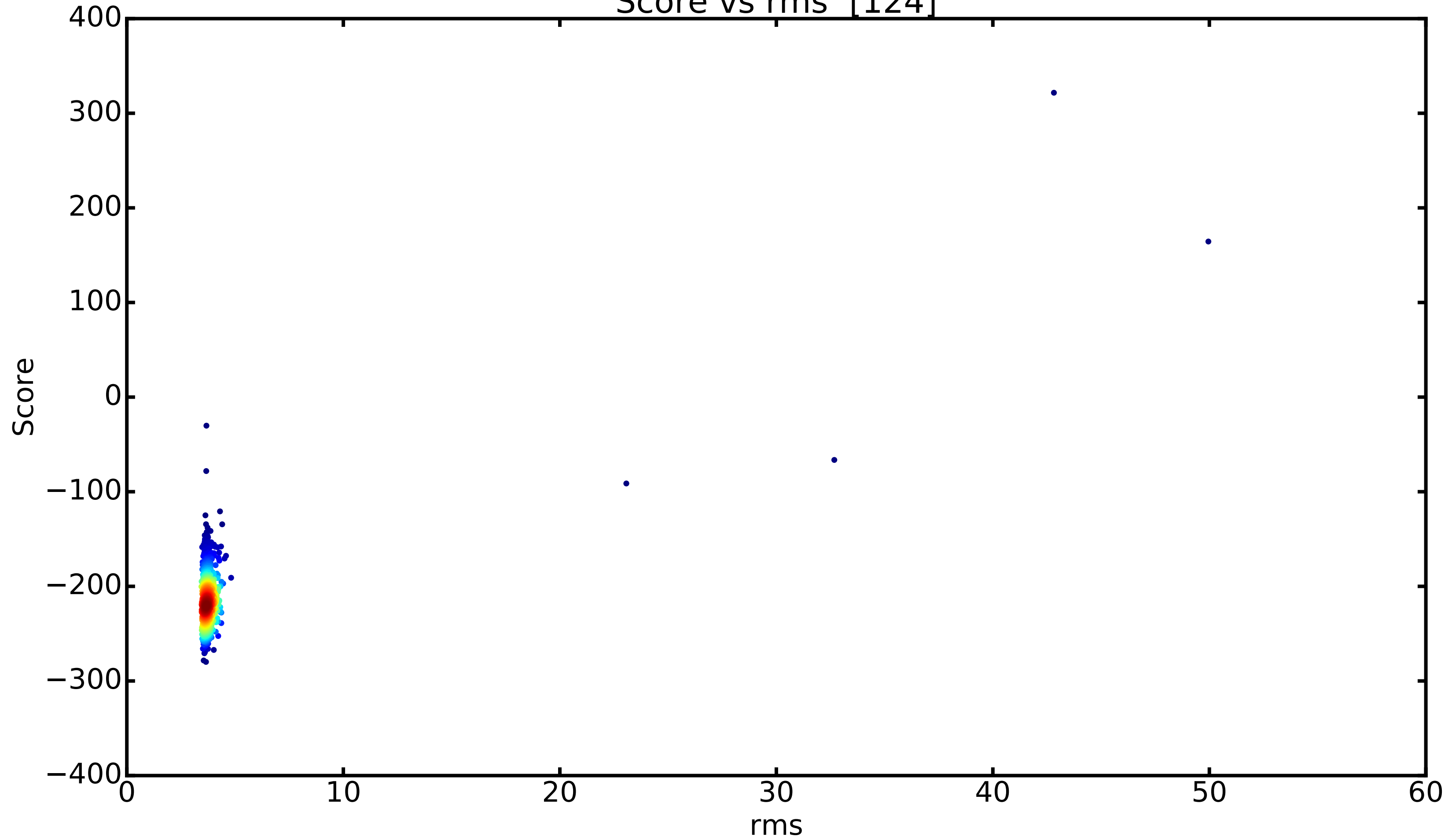
Score vs rms [122]



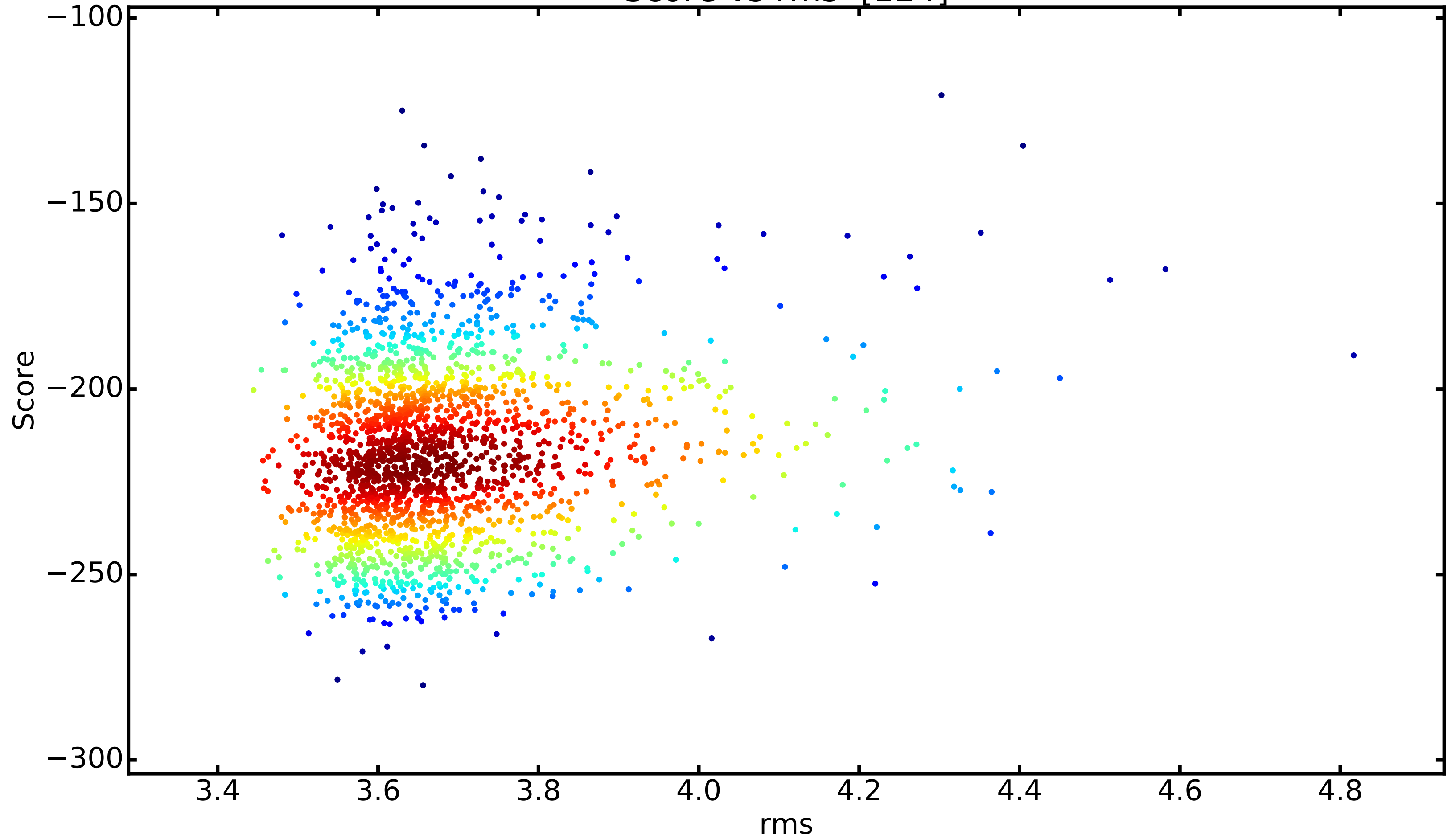
Score vs rms [122]



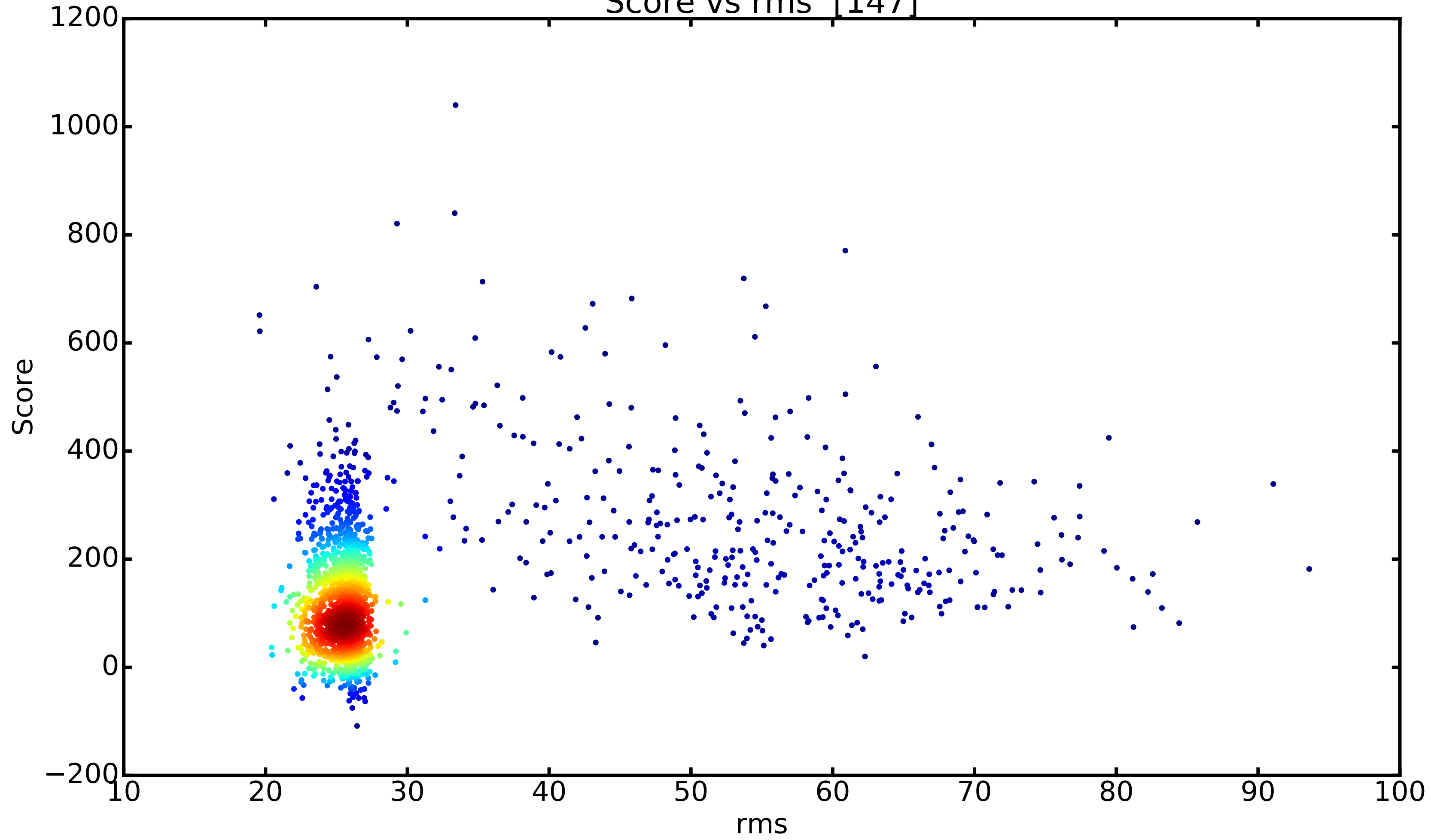
Score vs rms [124]



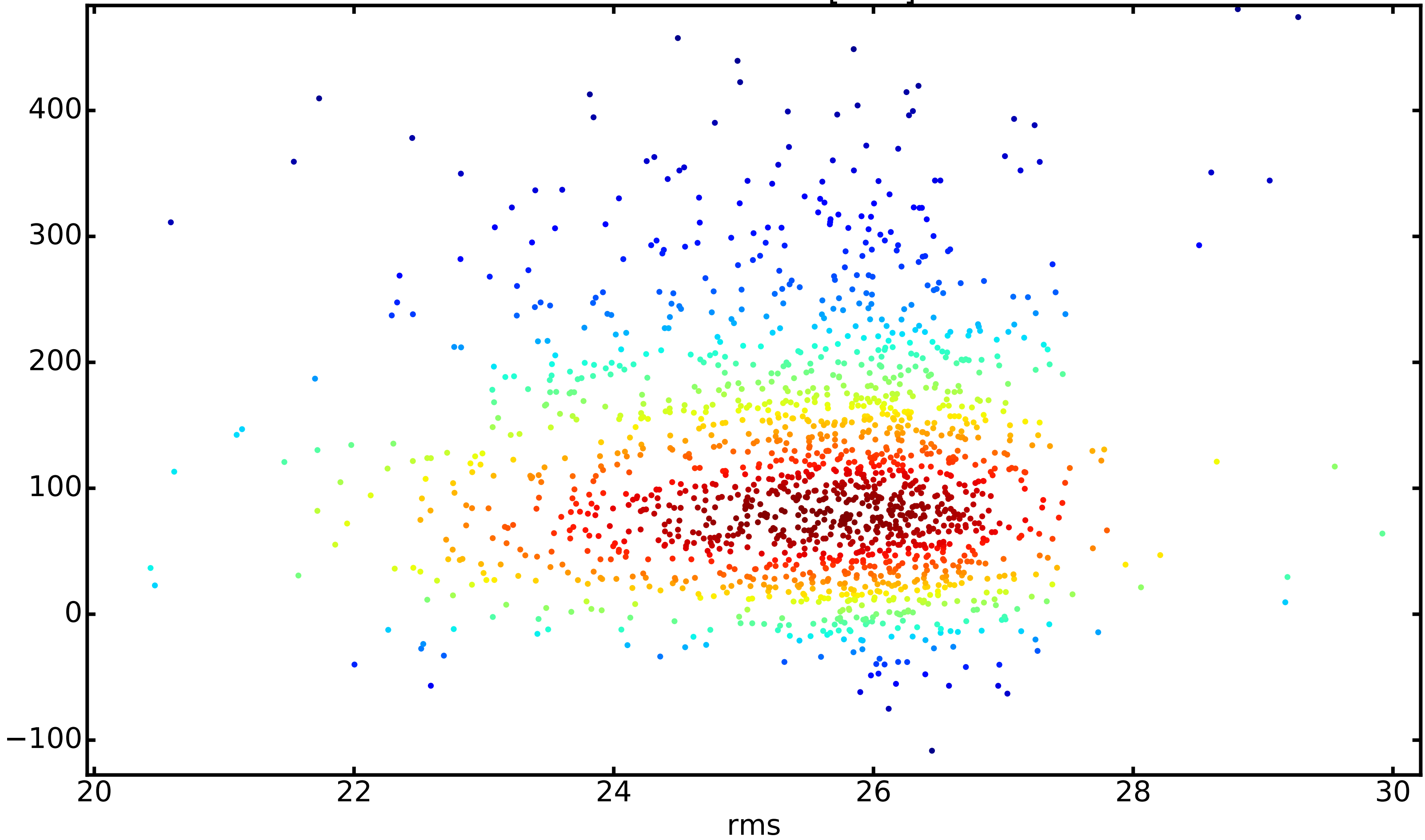
Score vs rms [124]



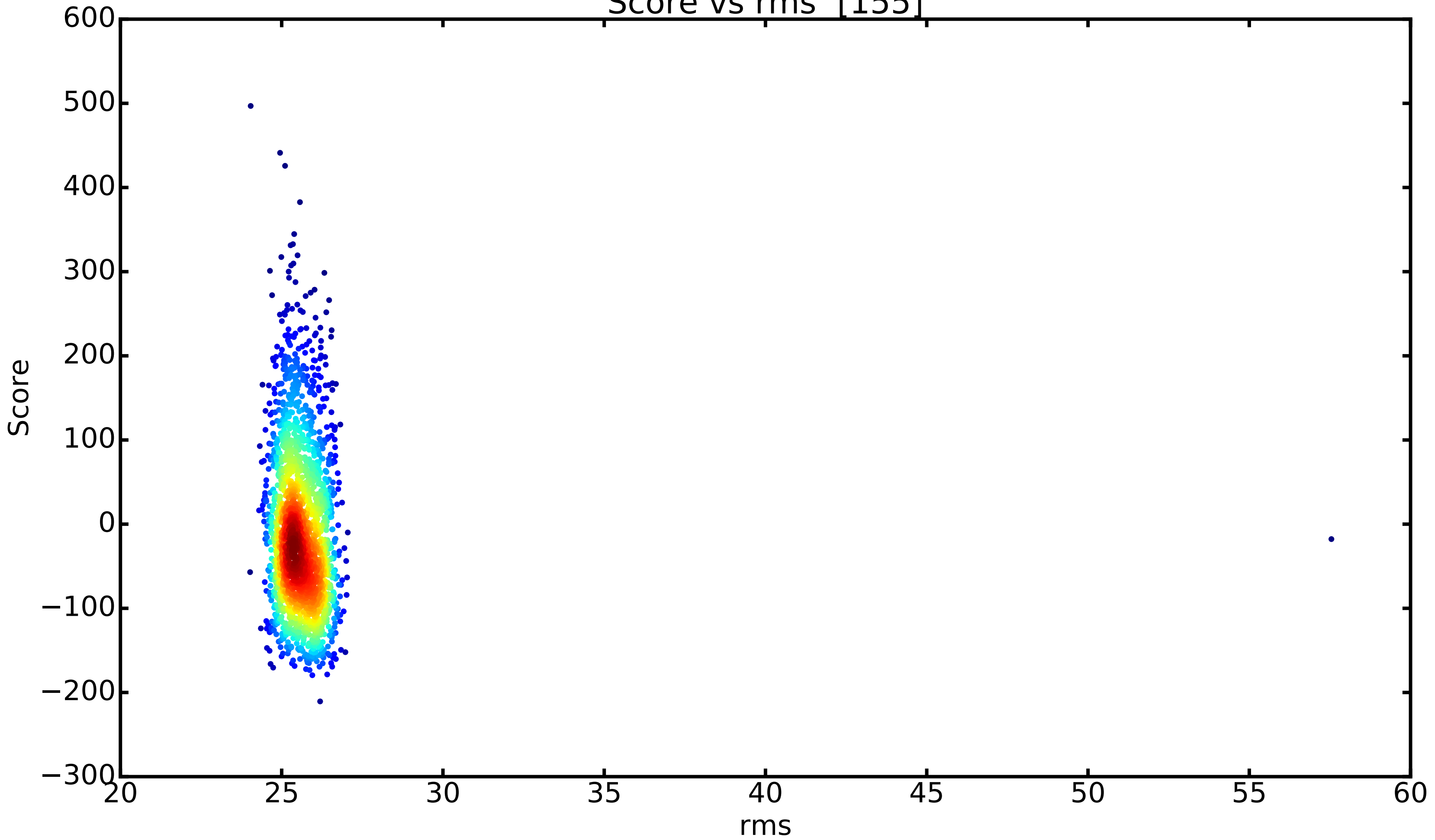
Score vs rms [147]



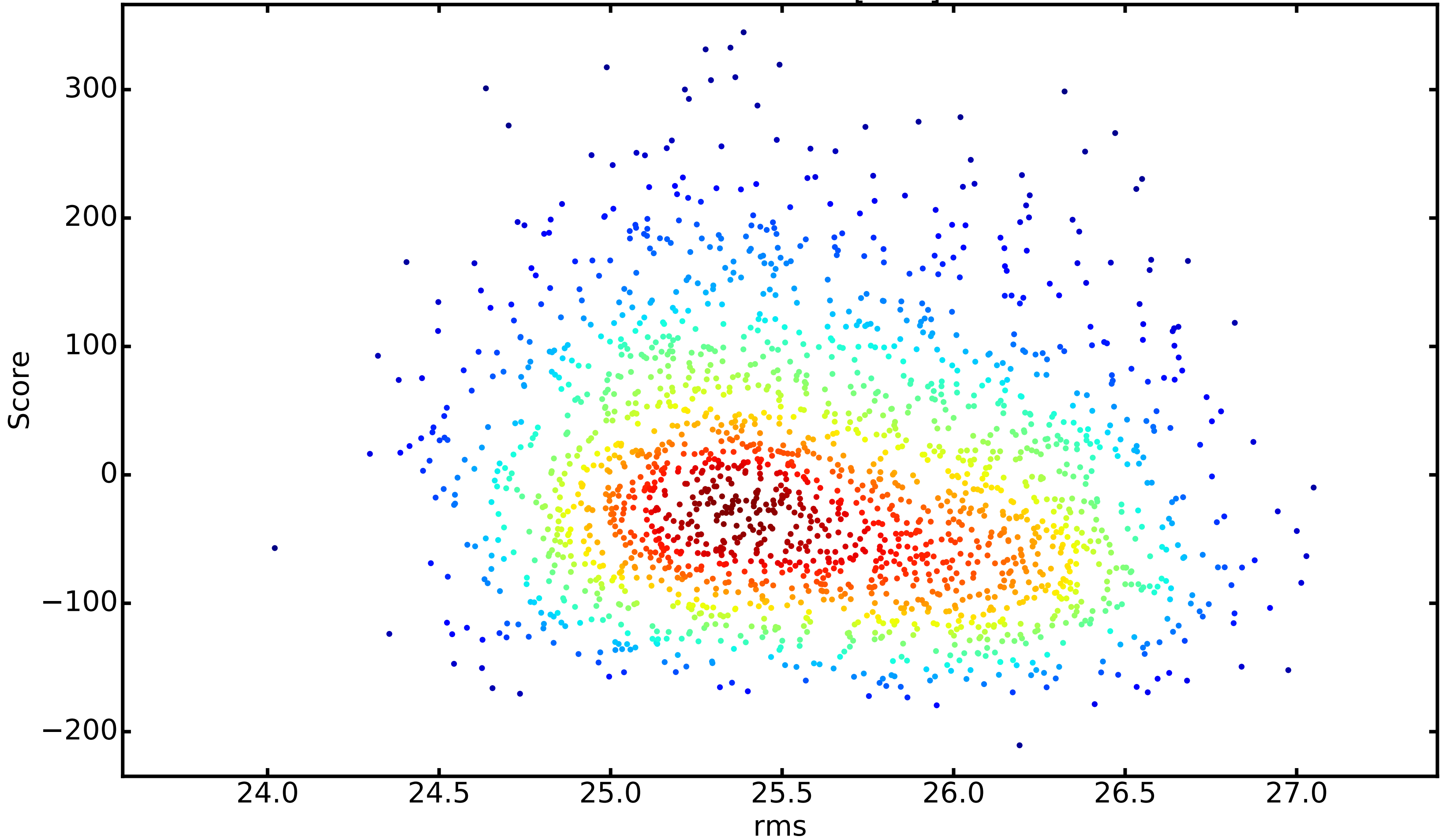
Score vs rms [147]



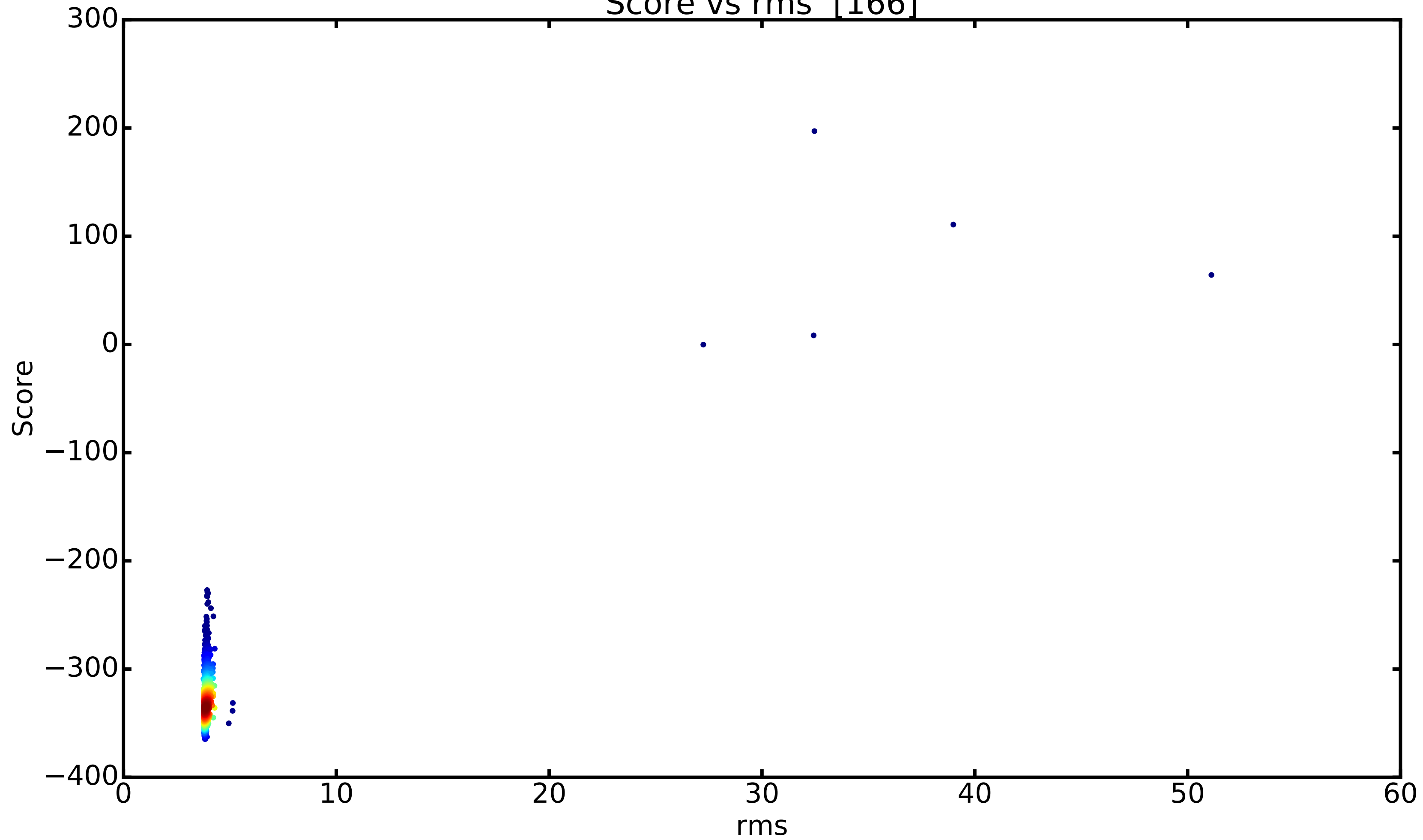
Score vs rms [155]



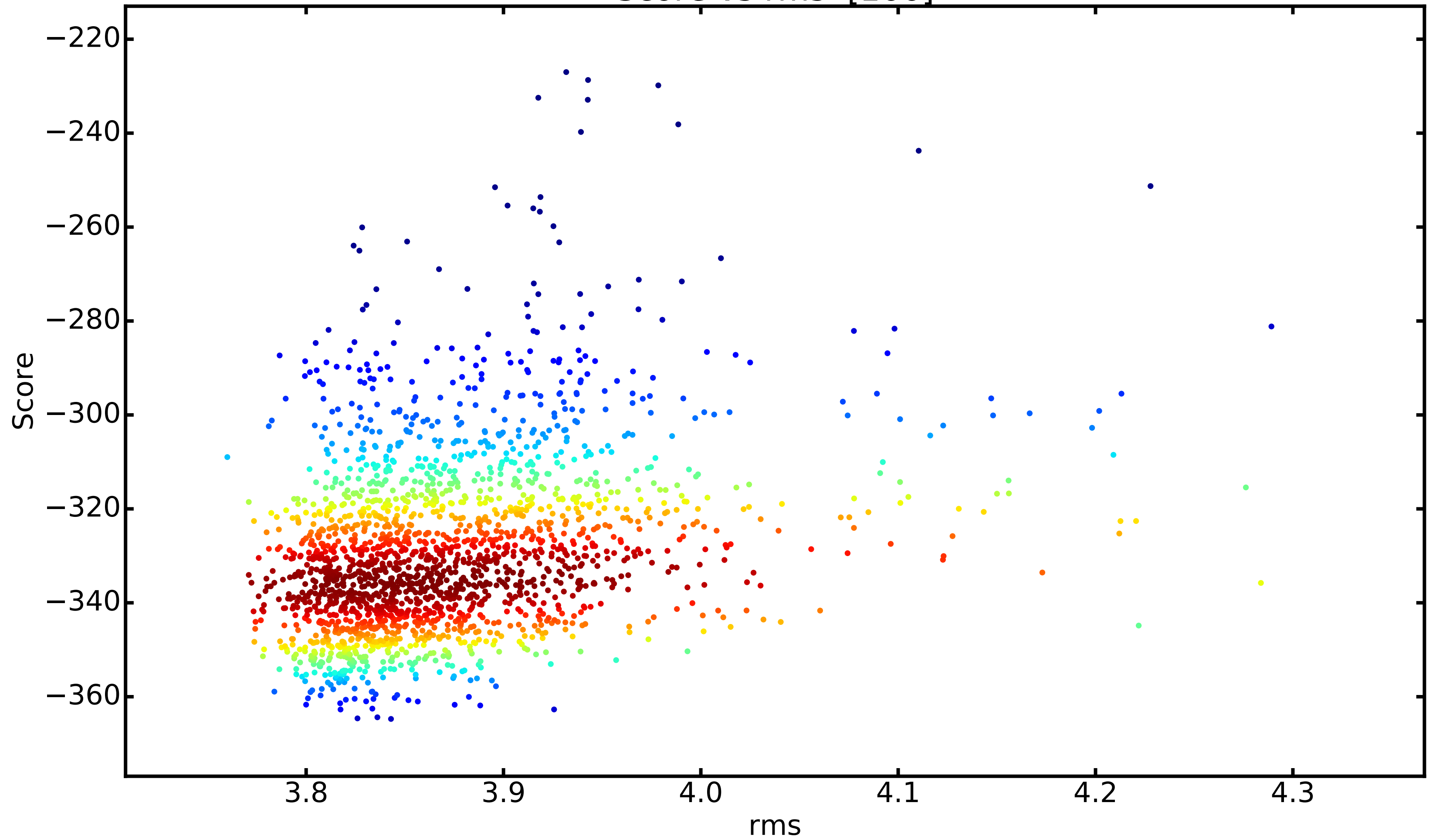
Score vs rms [155]

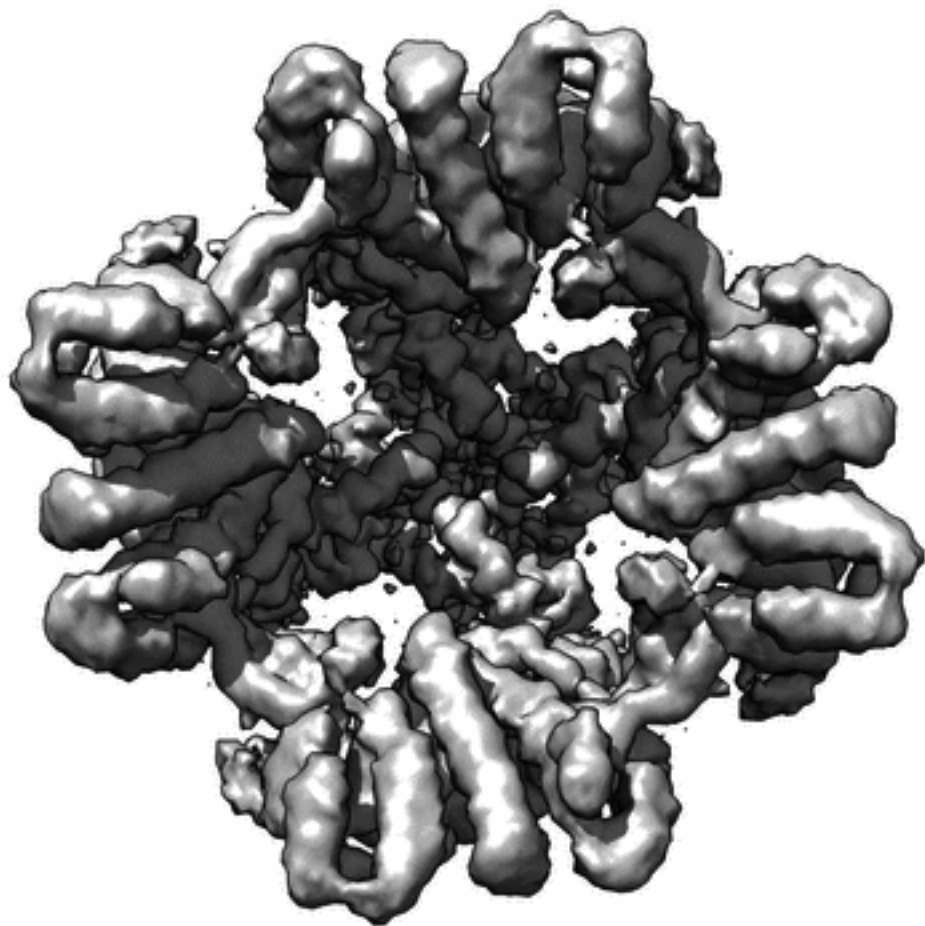


Score vs rms [166]

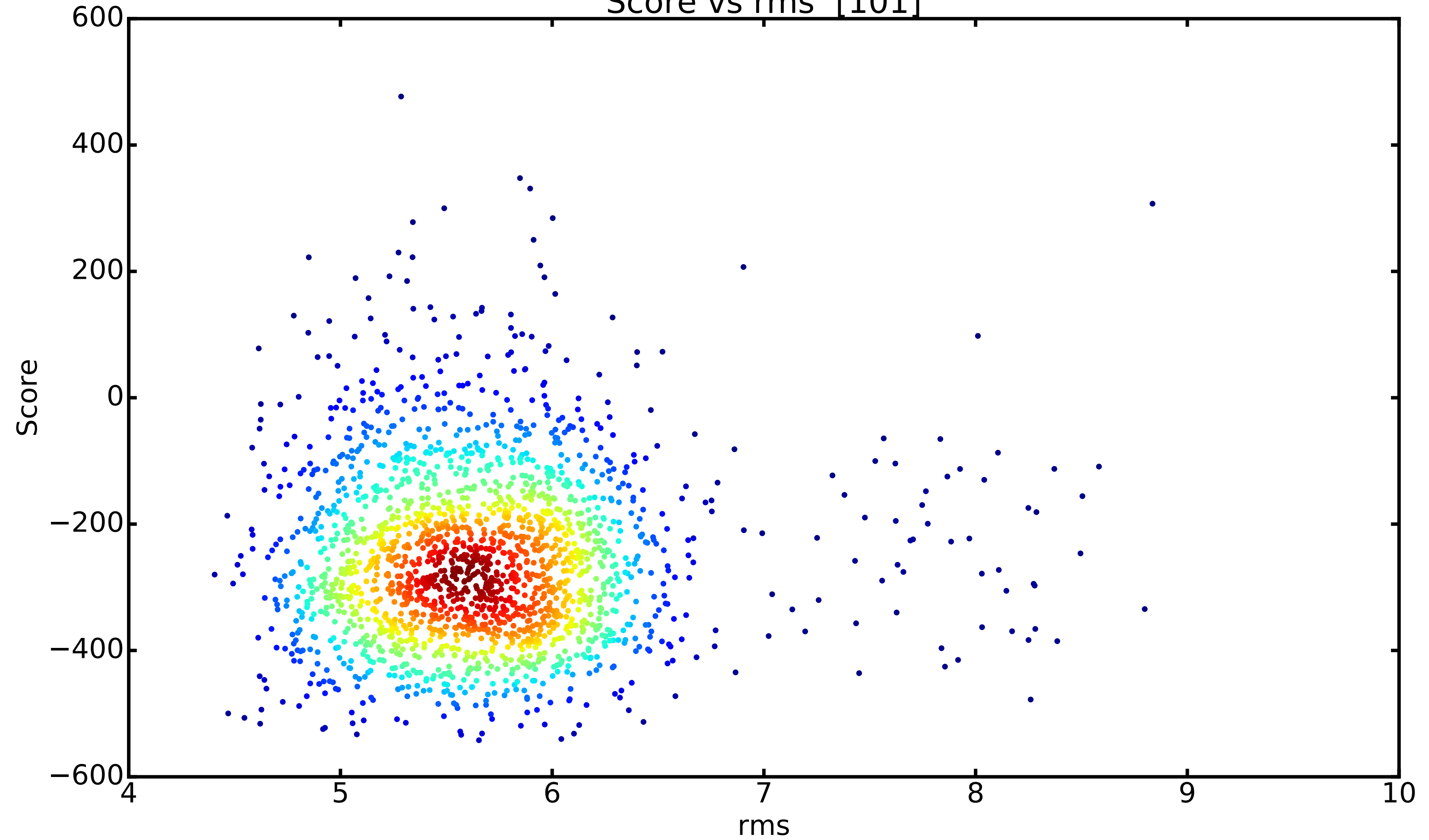


Score vs rms [166]

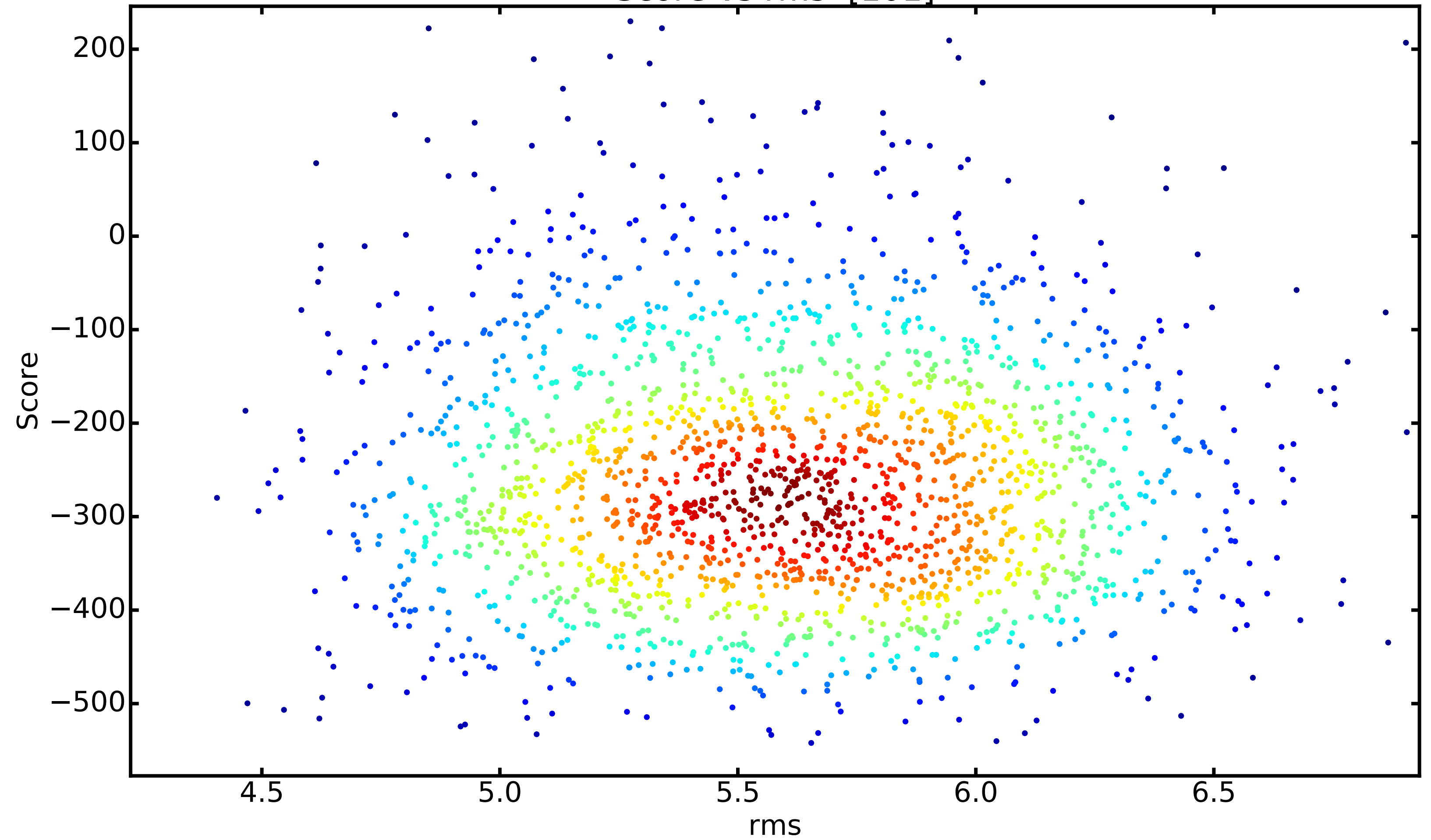




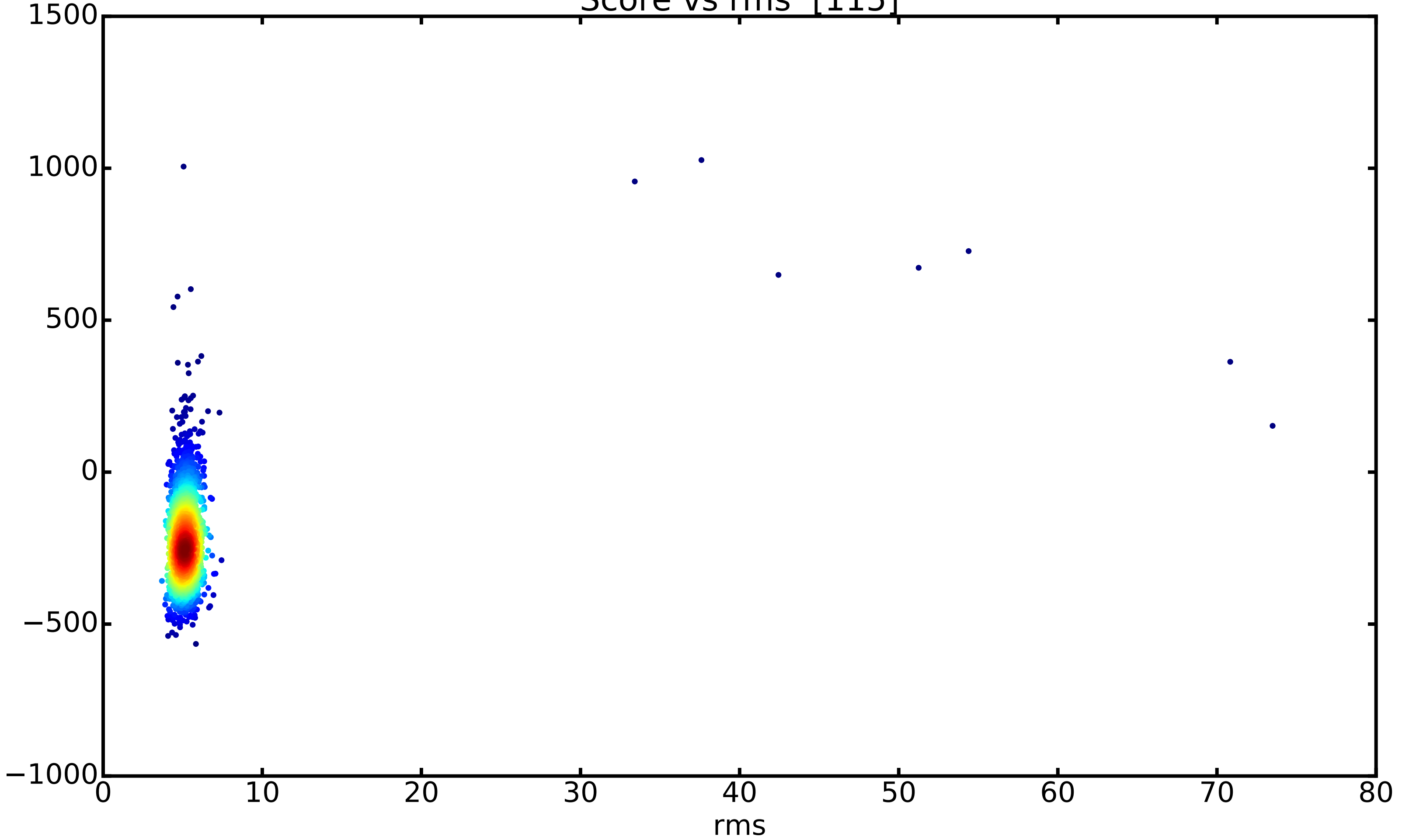
Score vs rms [101]



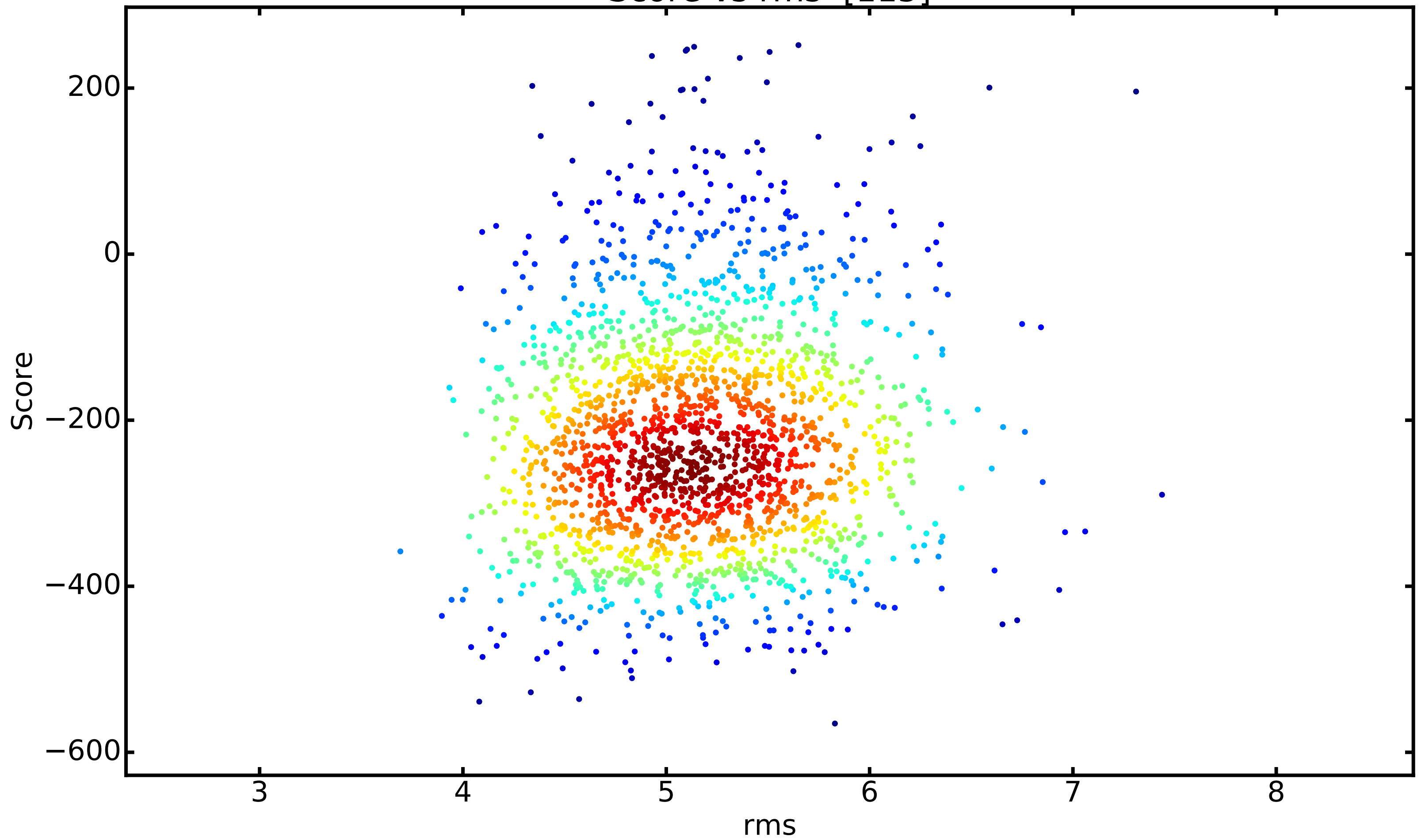
Score vs rms [101]



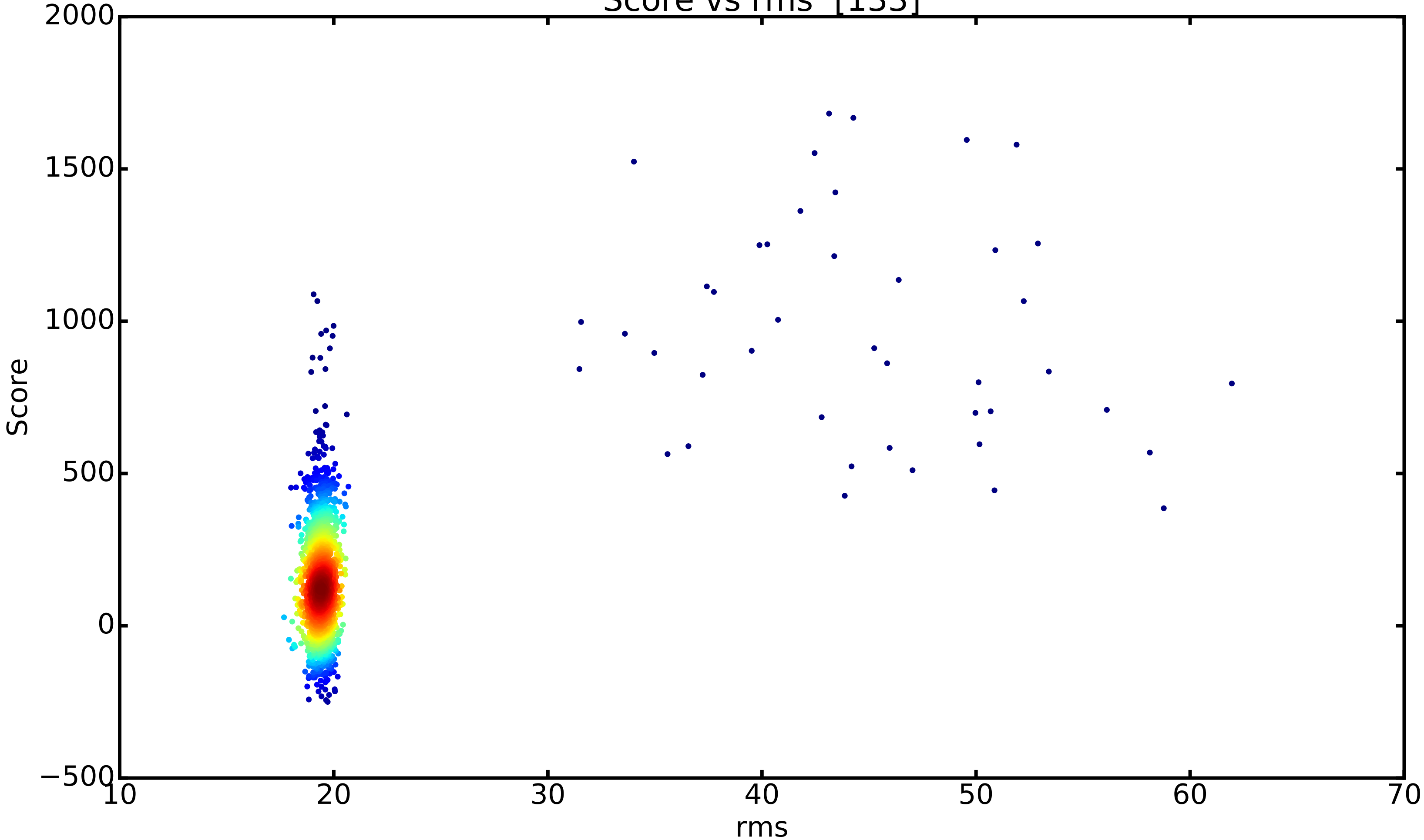
Score vs rms [115]



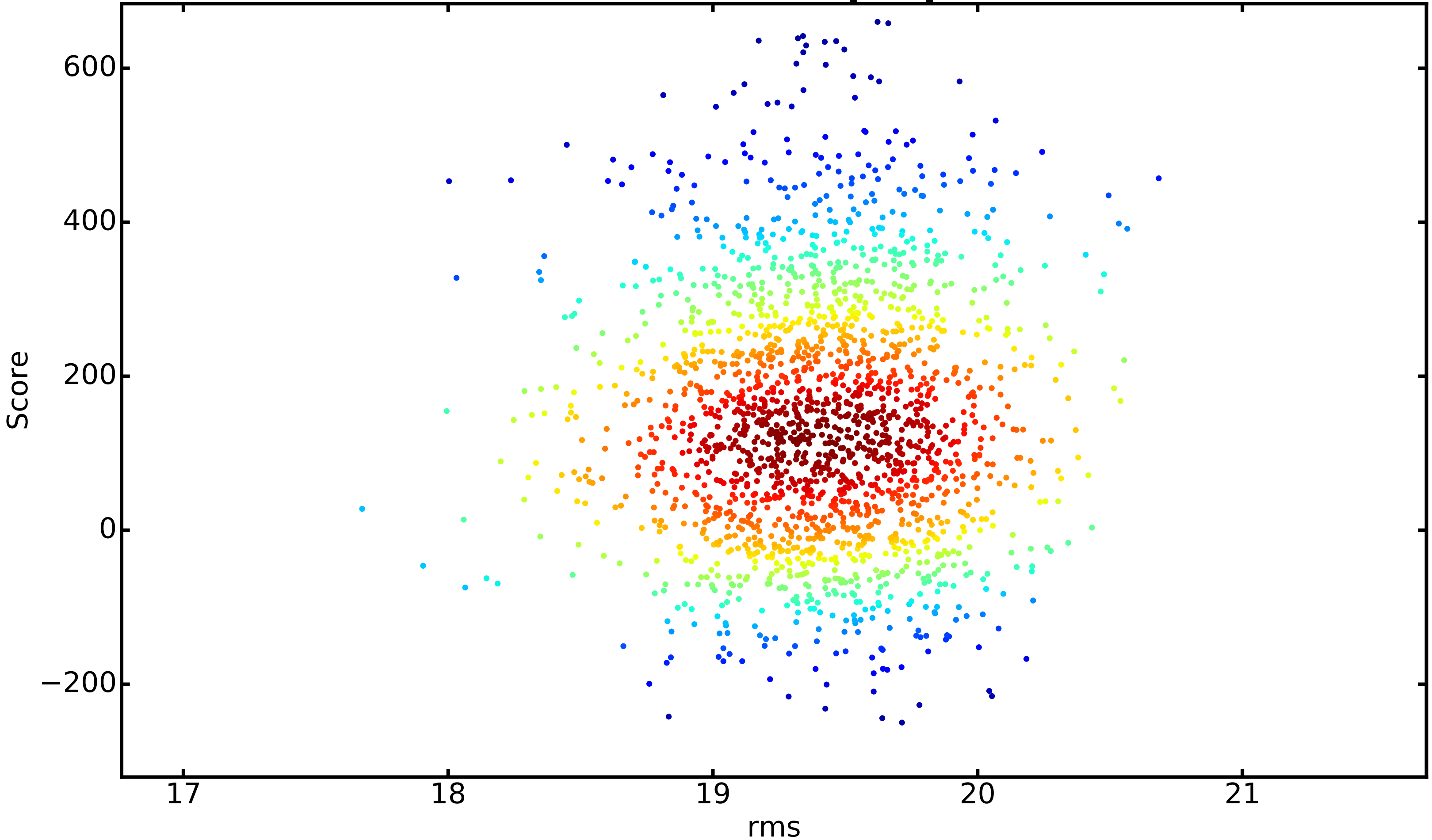
Score vs rms [115]



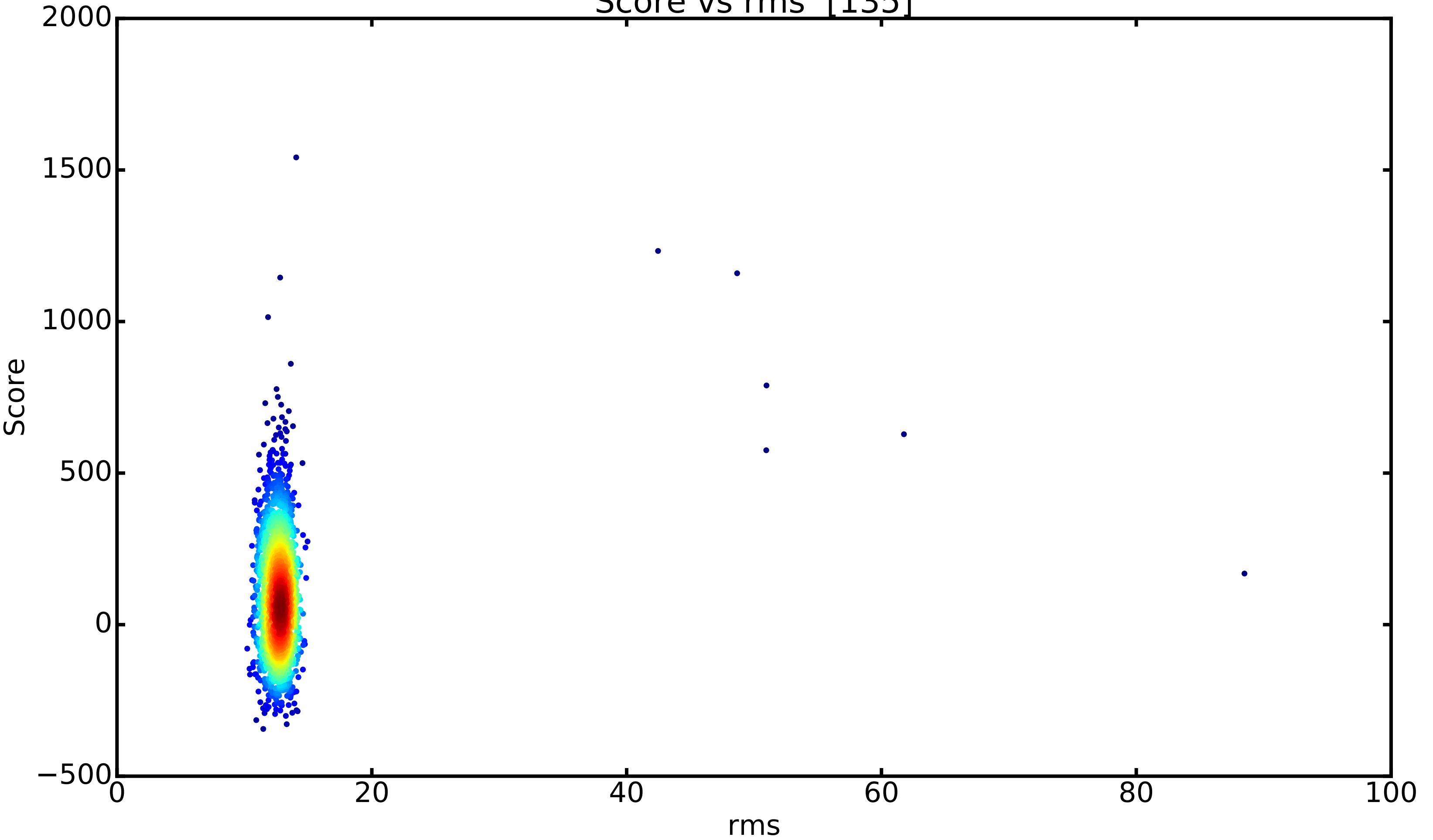
Score vs rms [133]



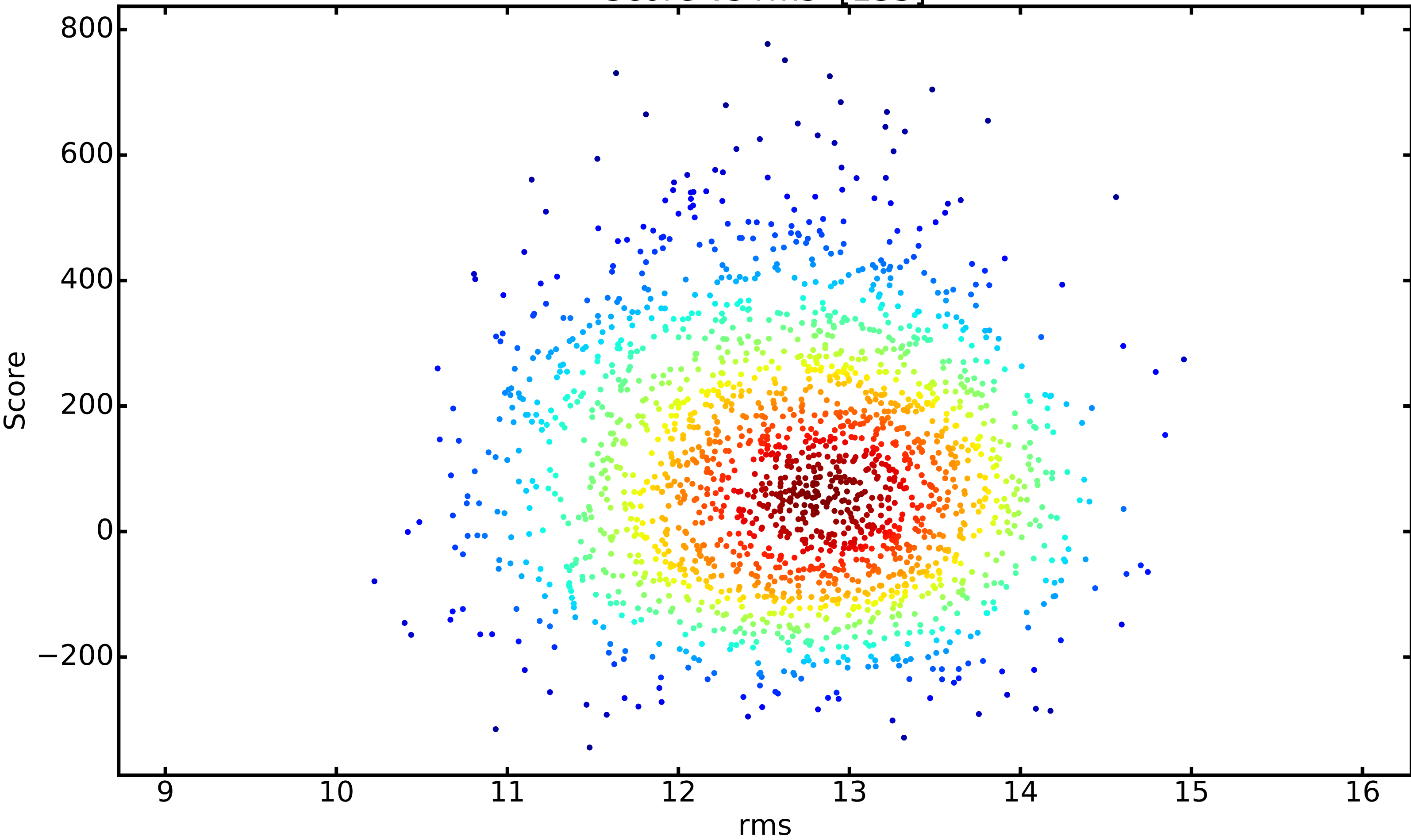
Score vs rms [133]



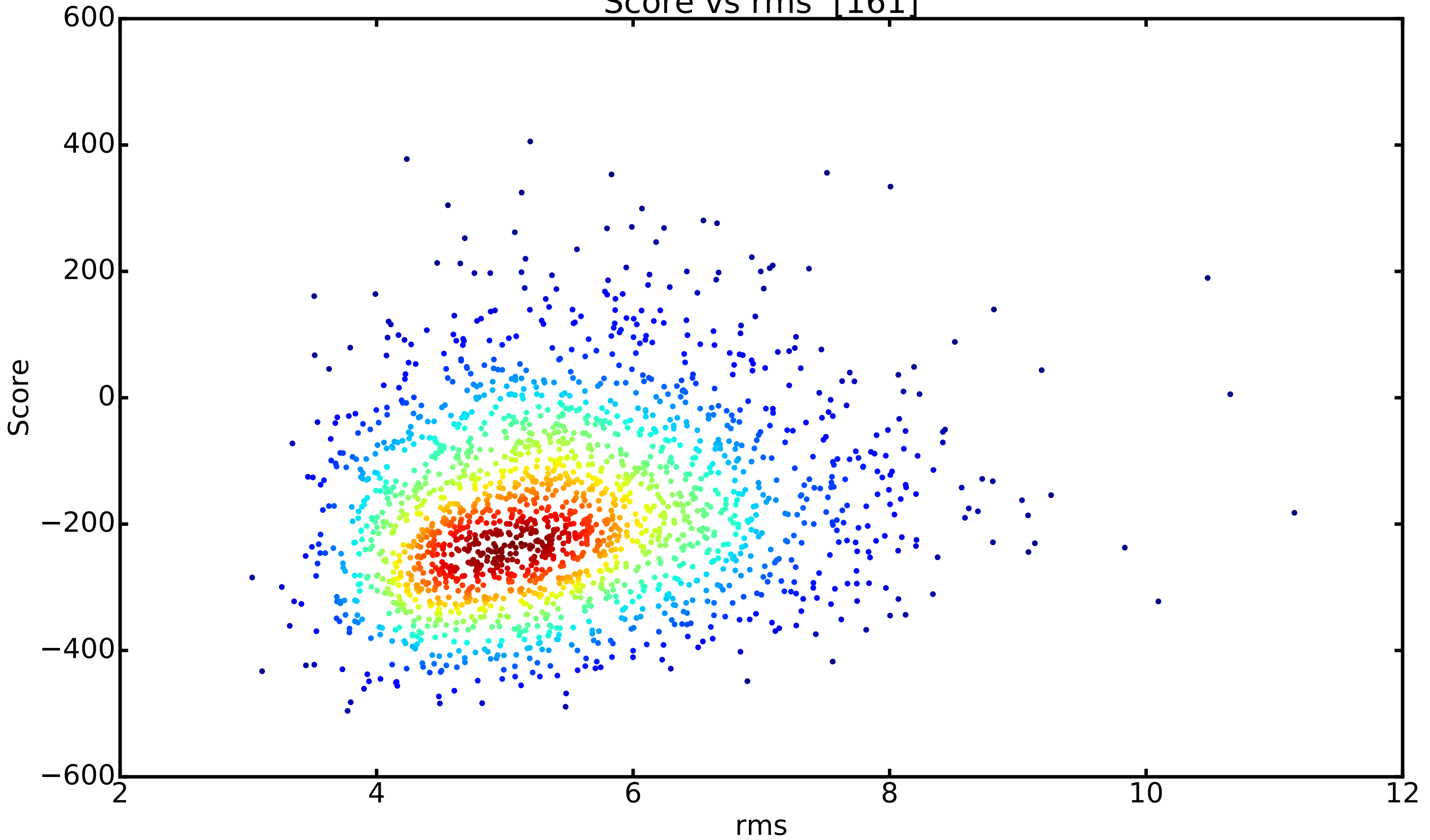
Score vs rms [135]

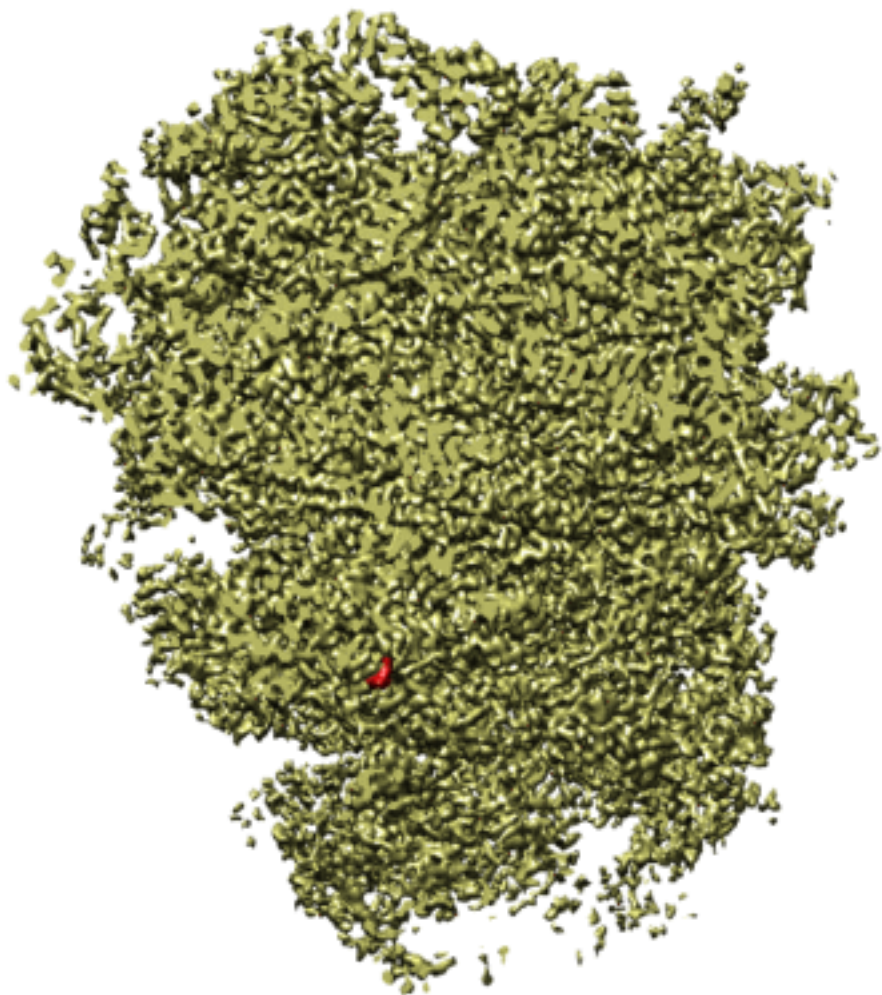


Score vs rms [135]

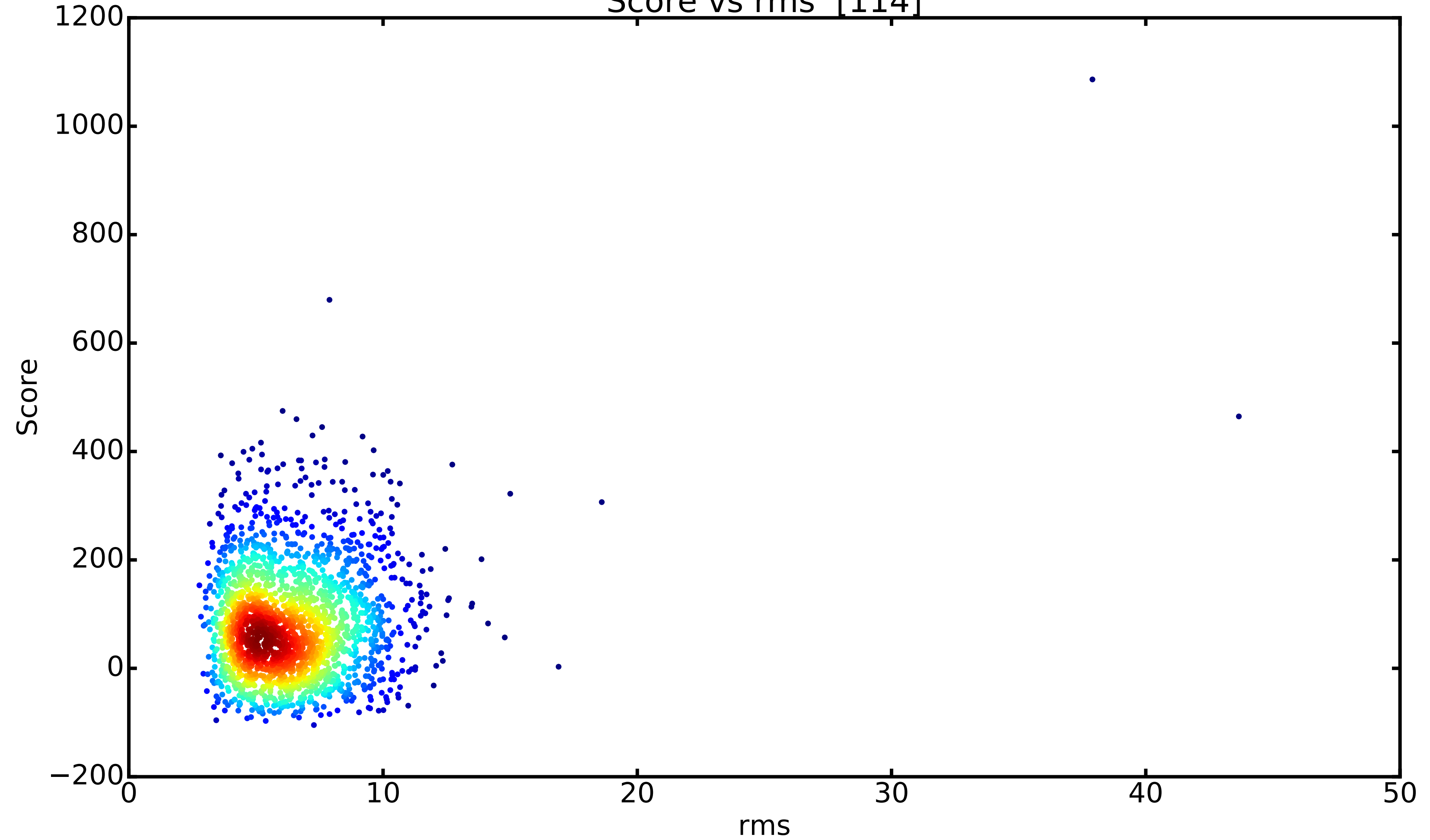


Score vs rms [161]

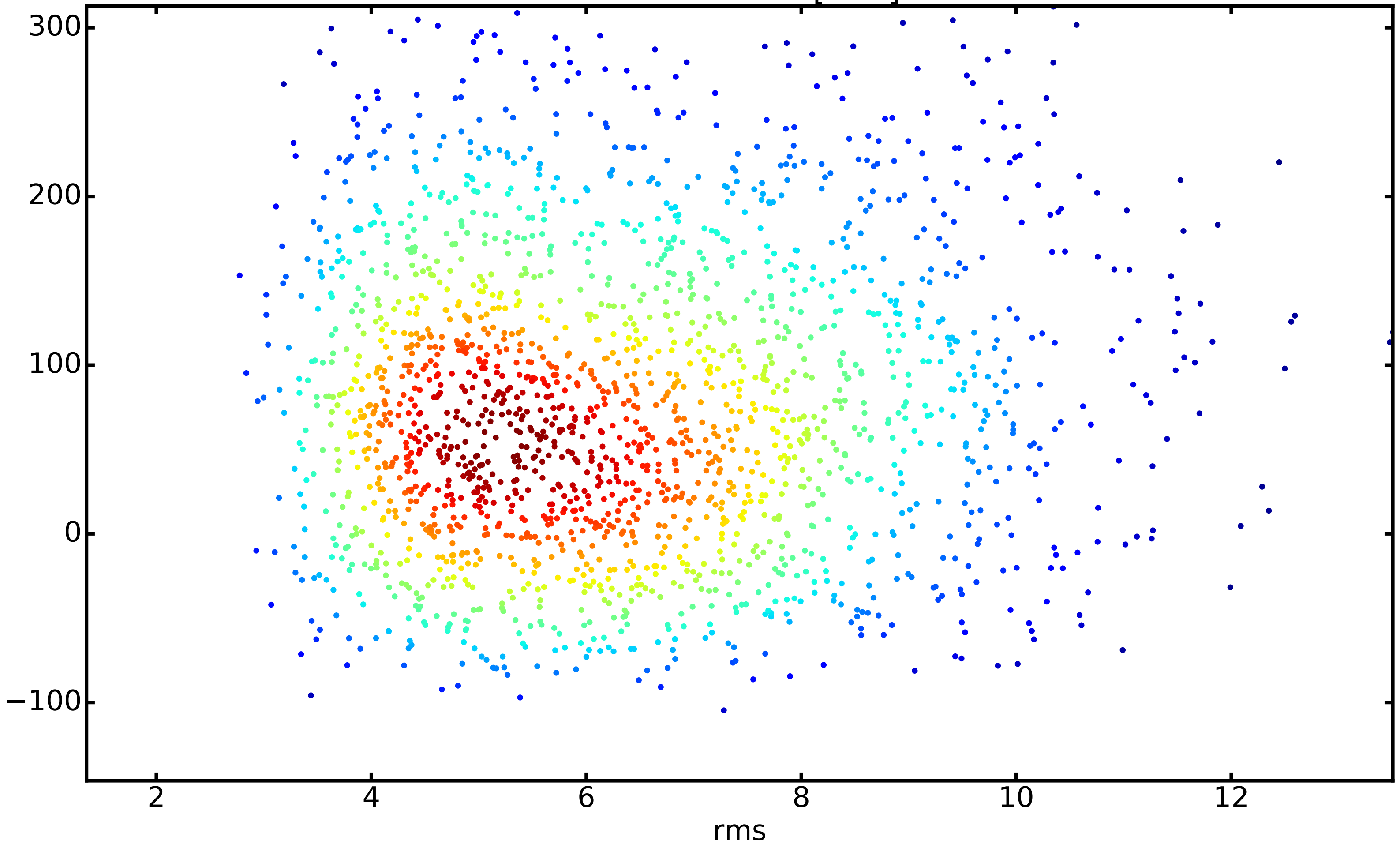




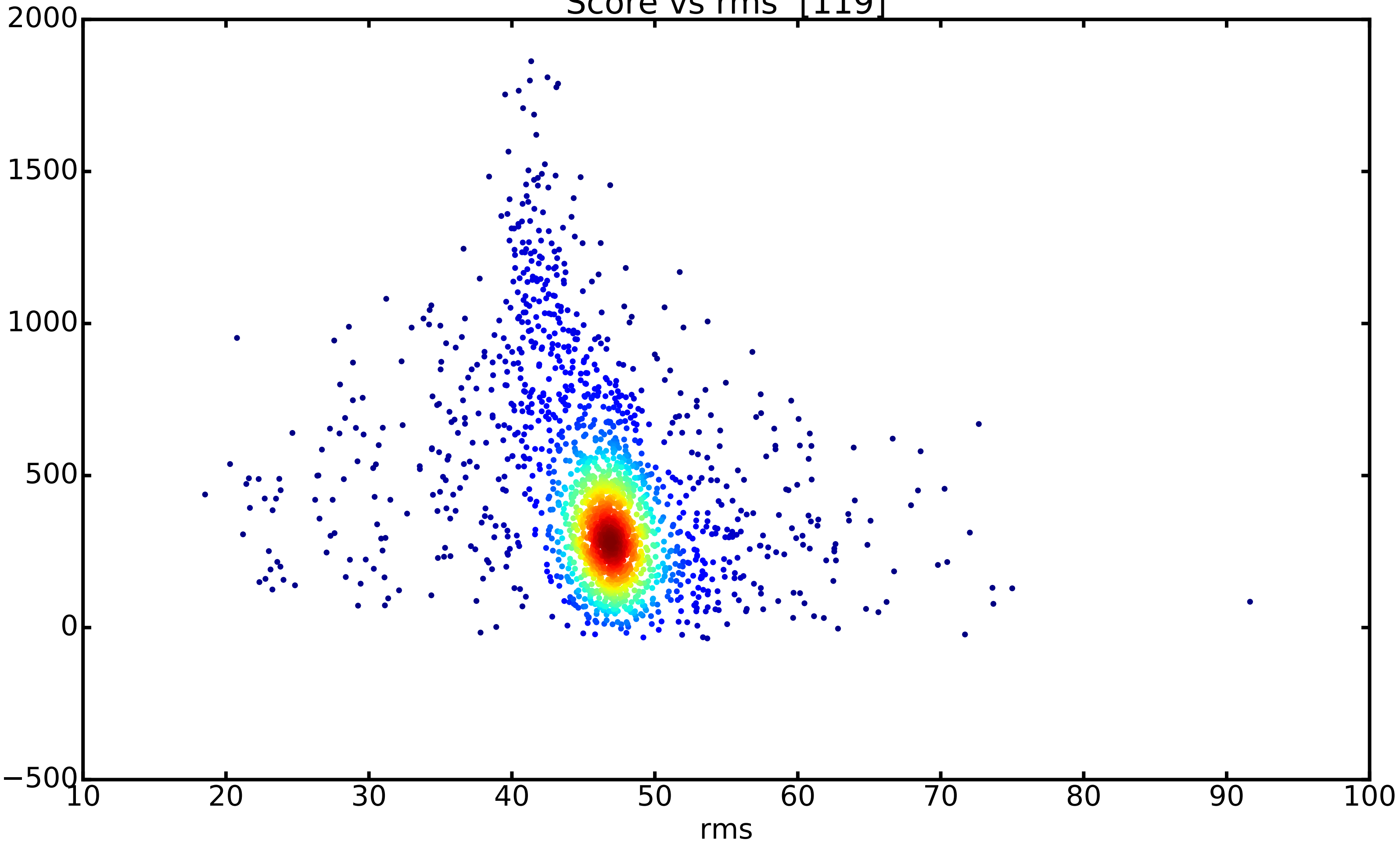
Score vs rms [114]



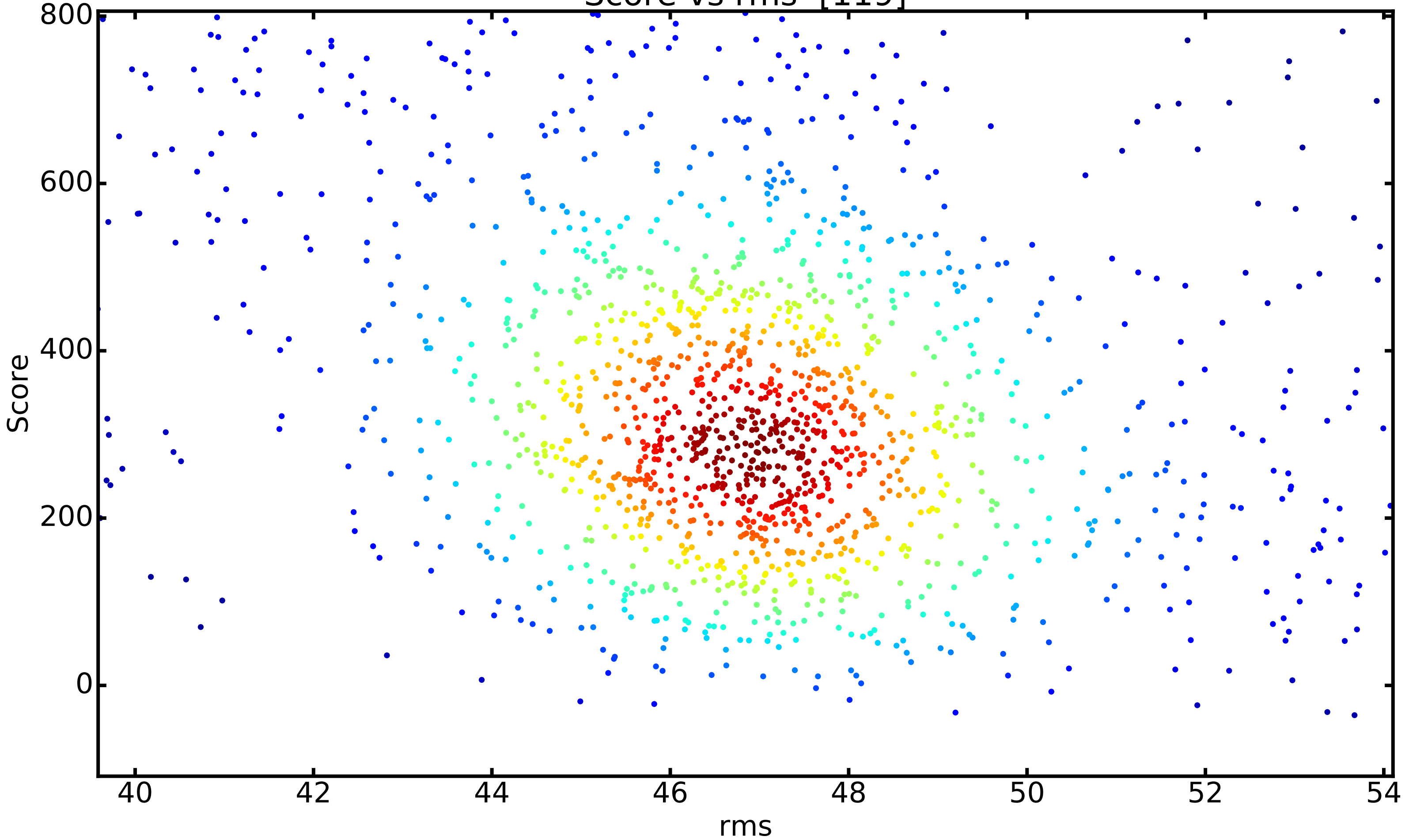
Score vs rms [114]



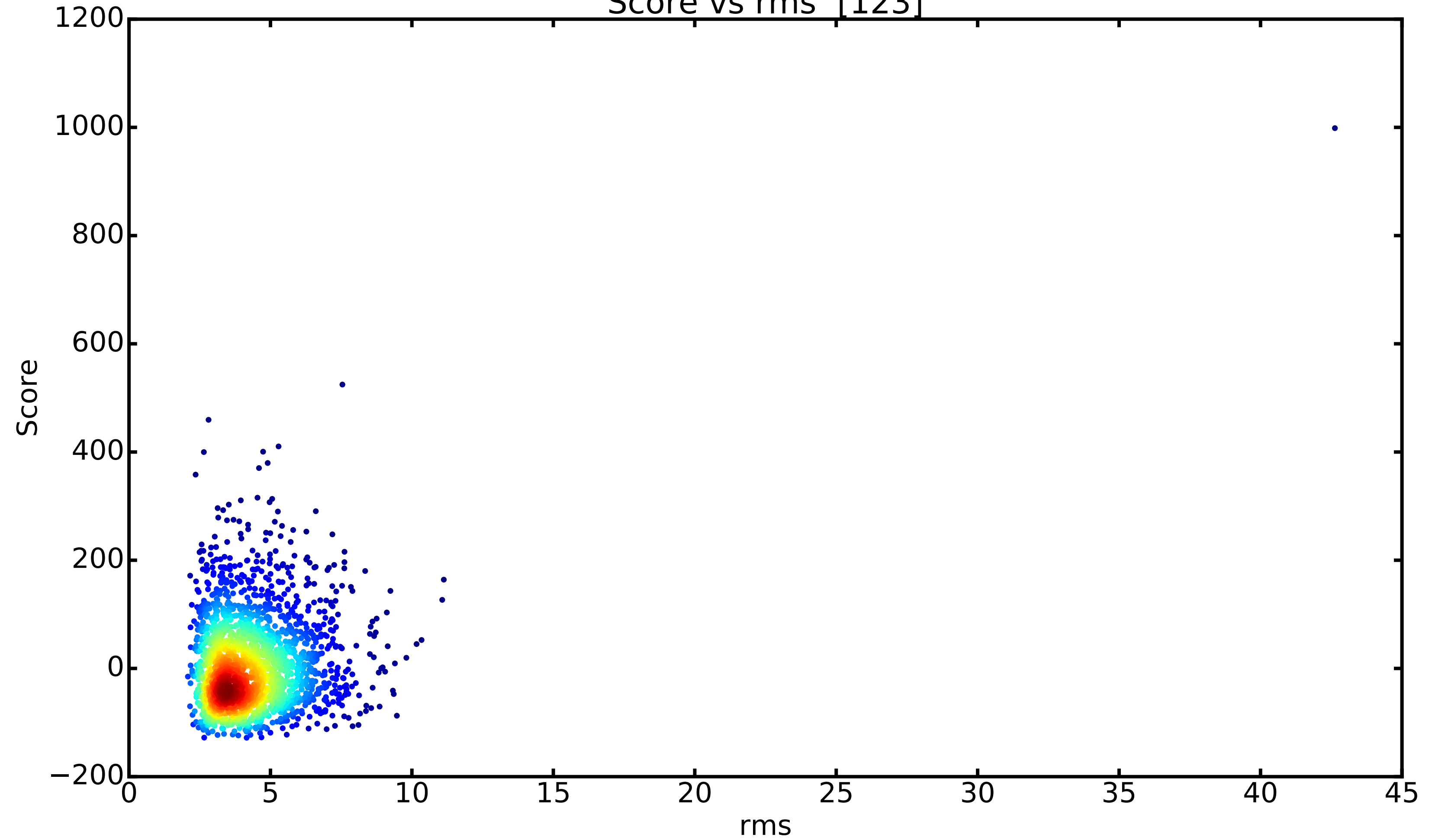
Score vs rms [119]



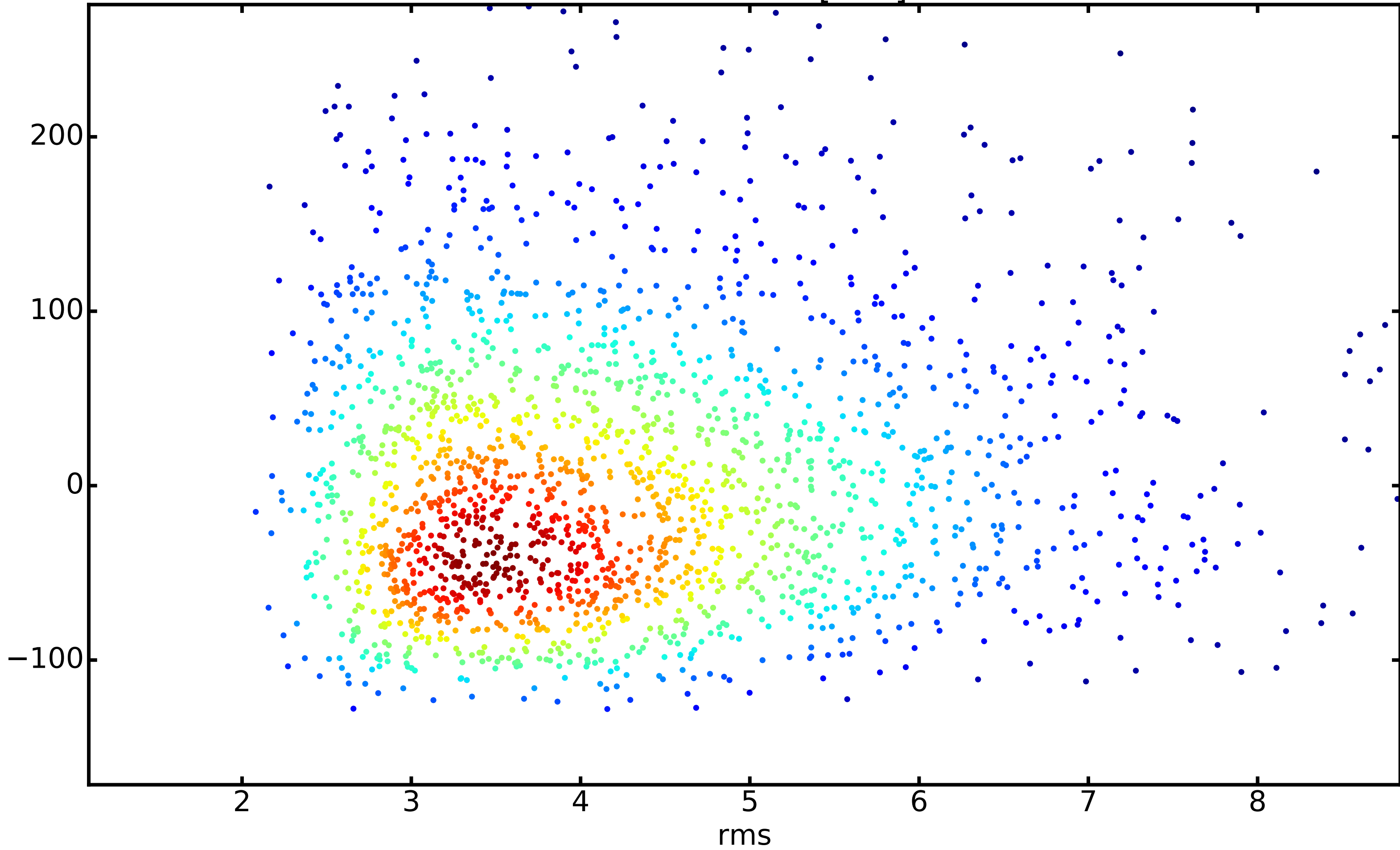
Score vs rms [119]



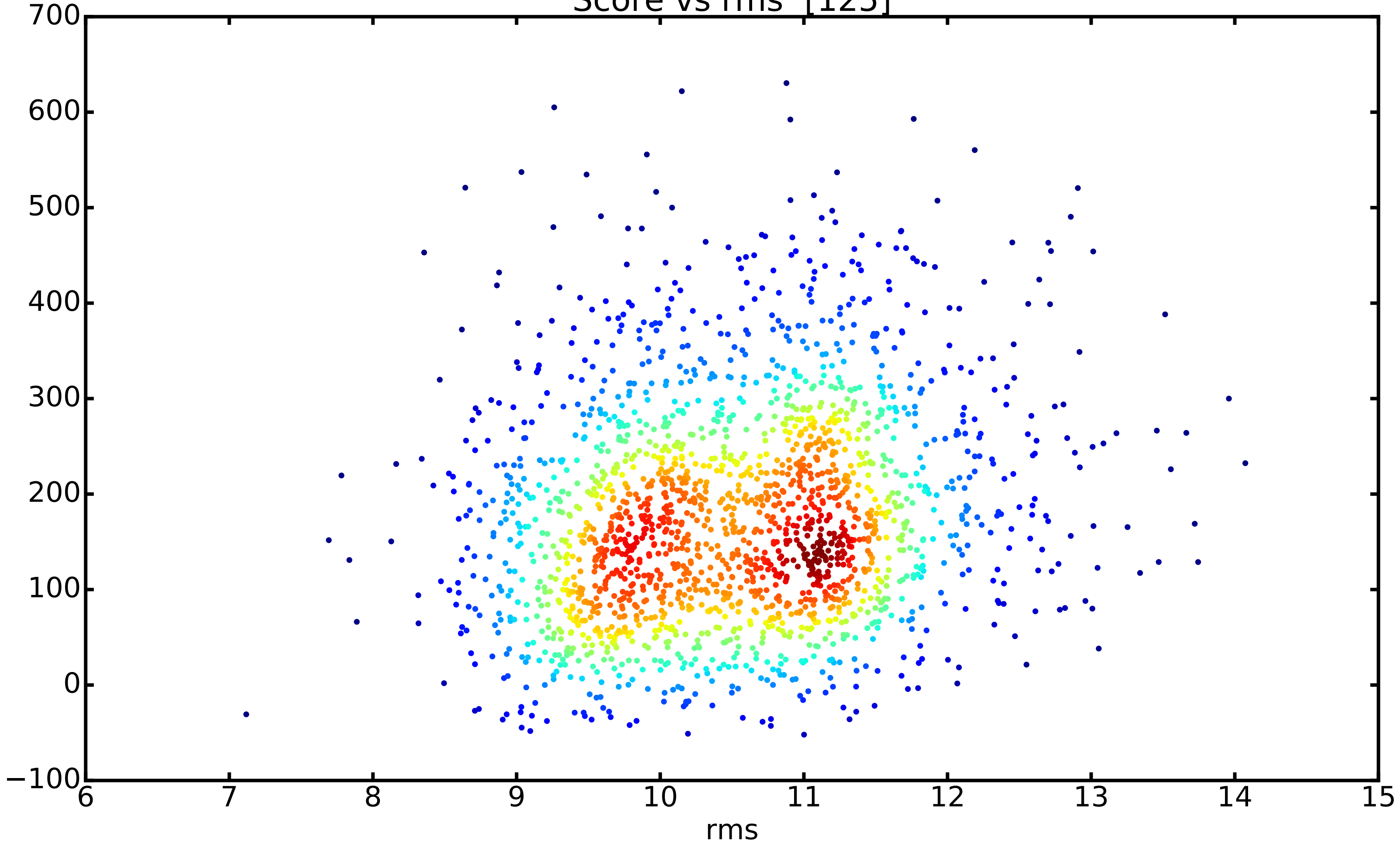
Score vs rms [123]



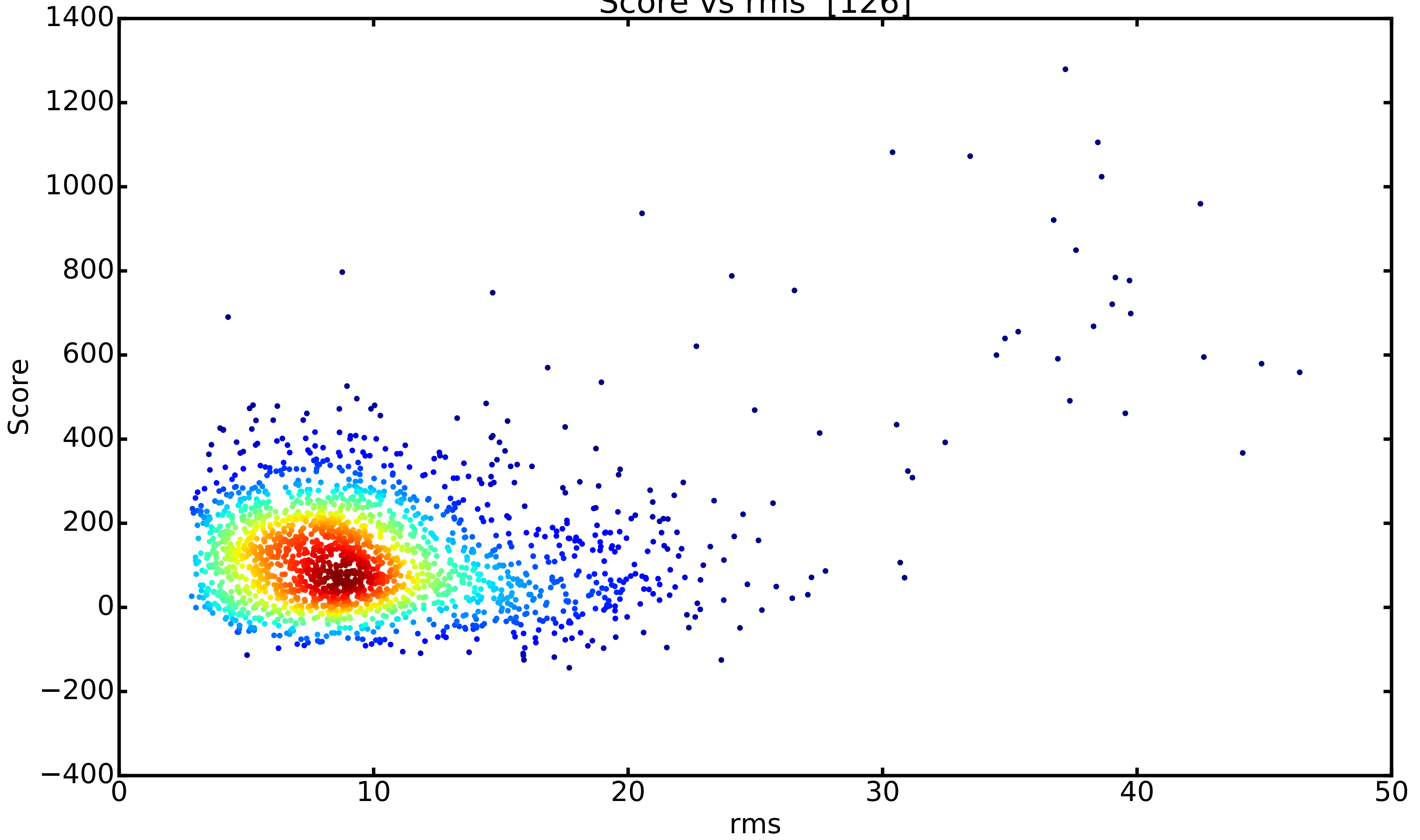
Score vs rms [123]



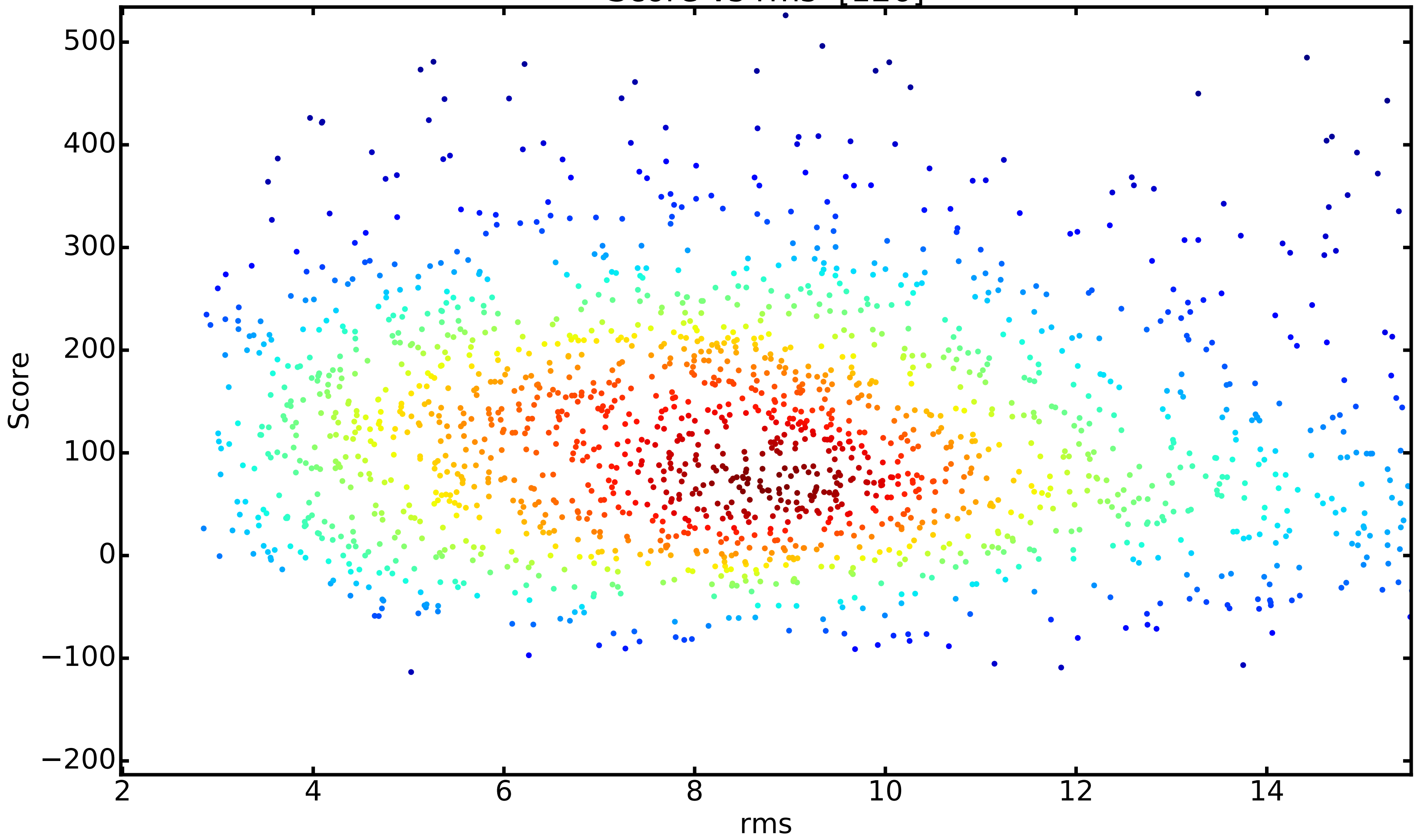
Score vs rms [125]



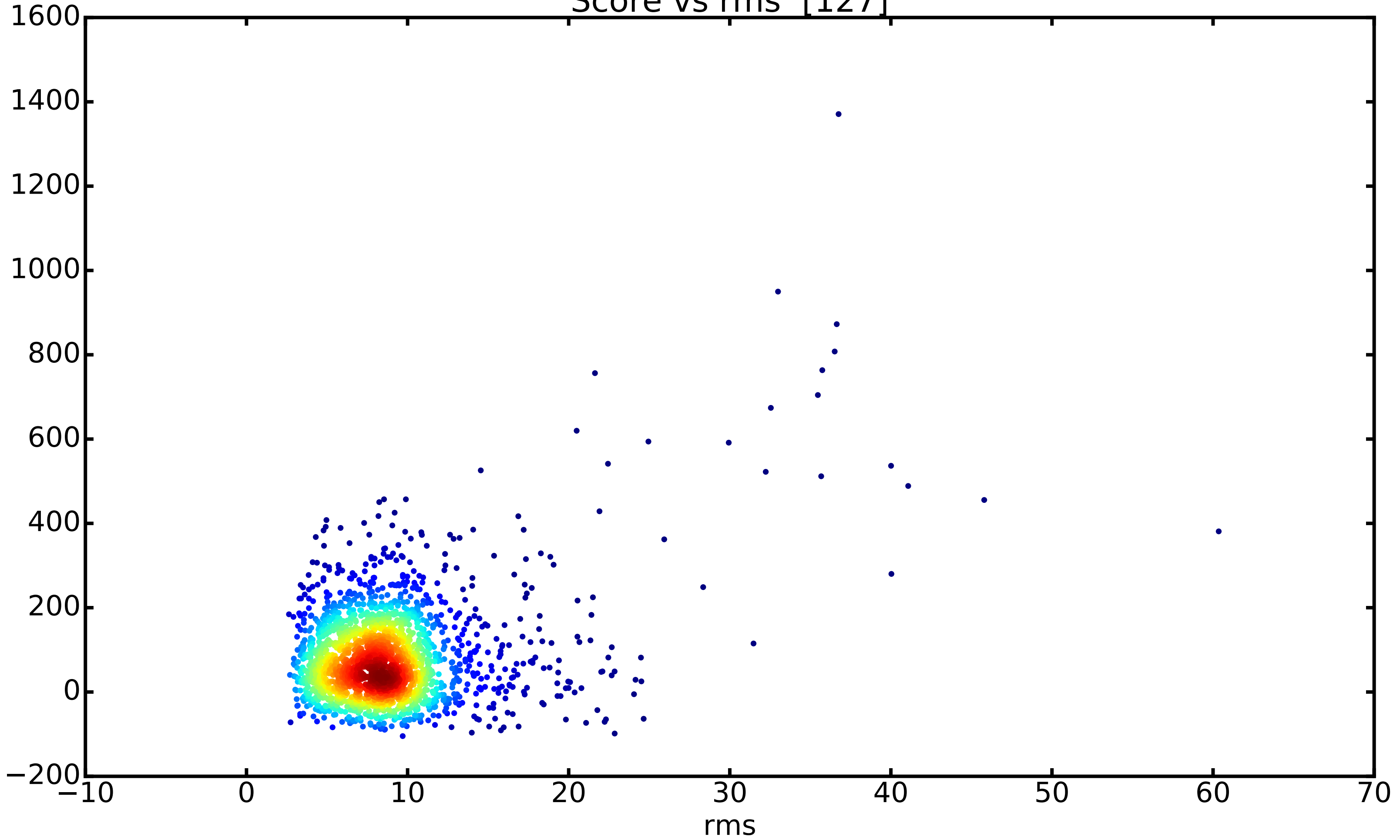
Score vs rms [126]



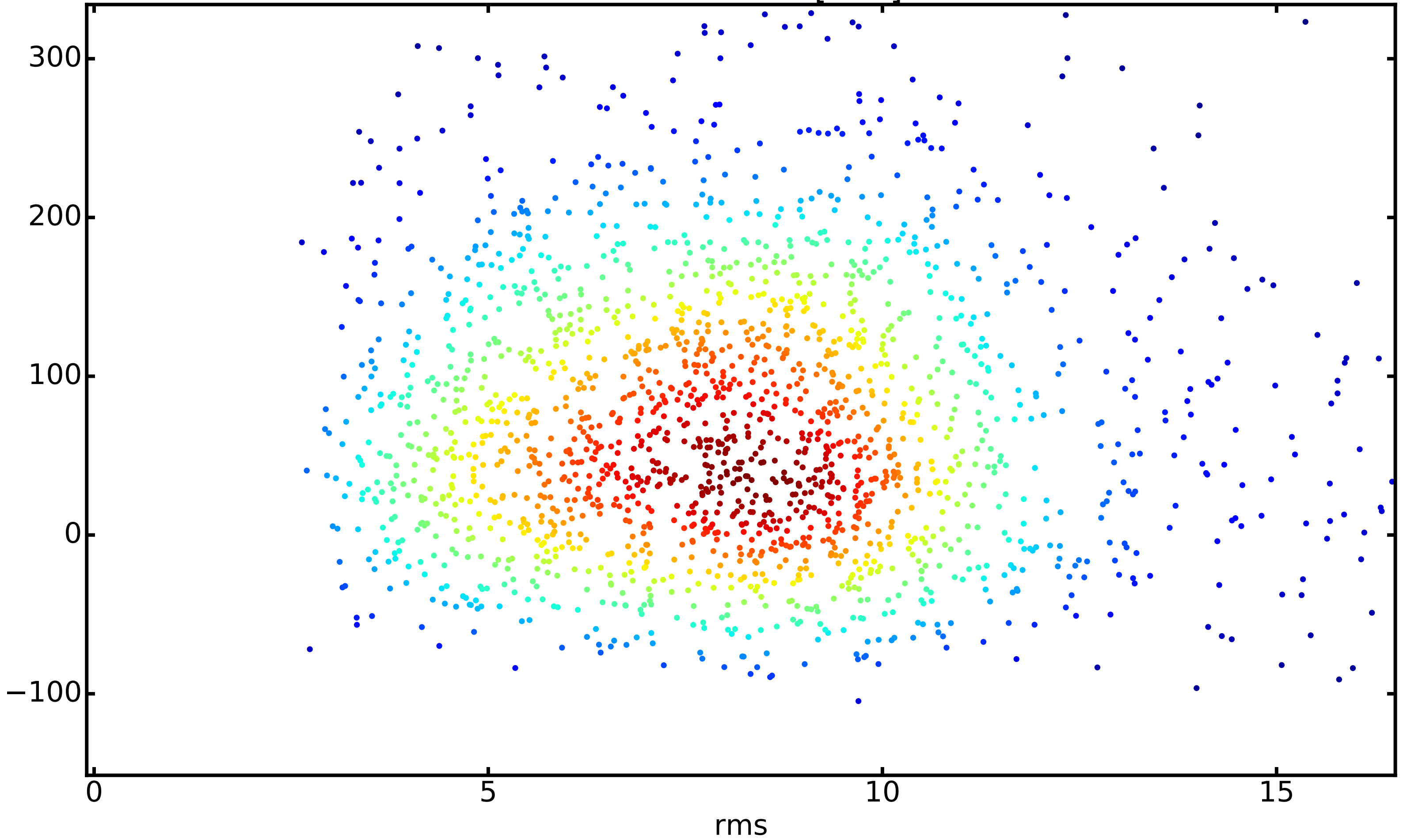
Score vs rms [126]



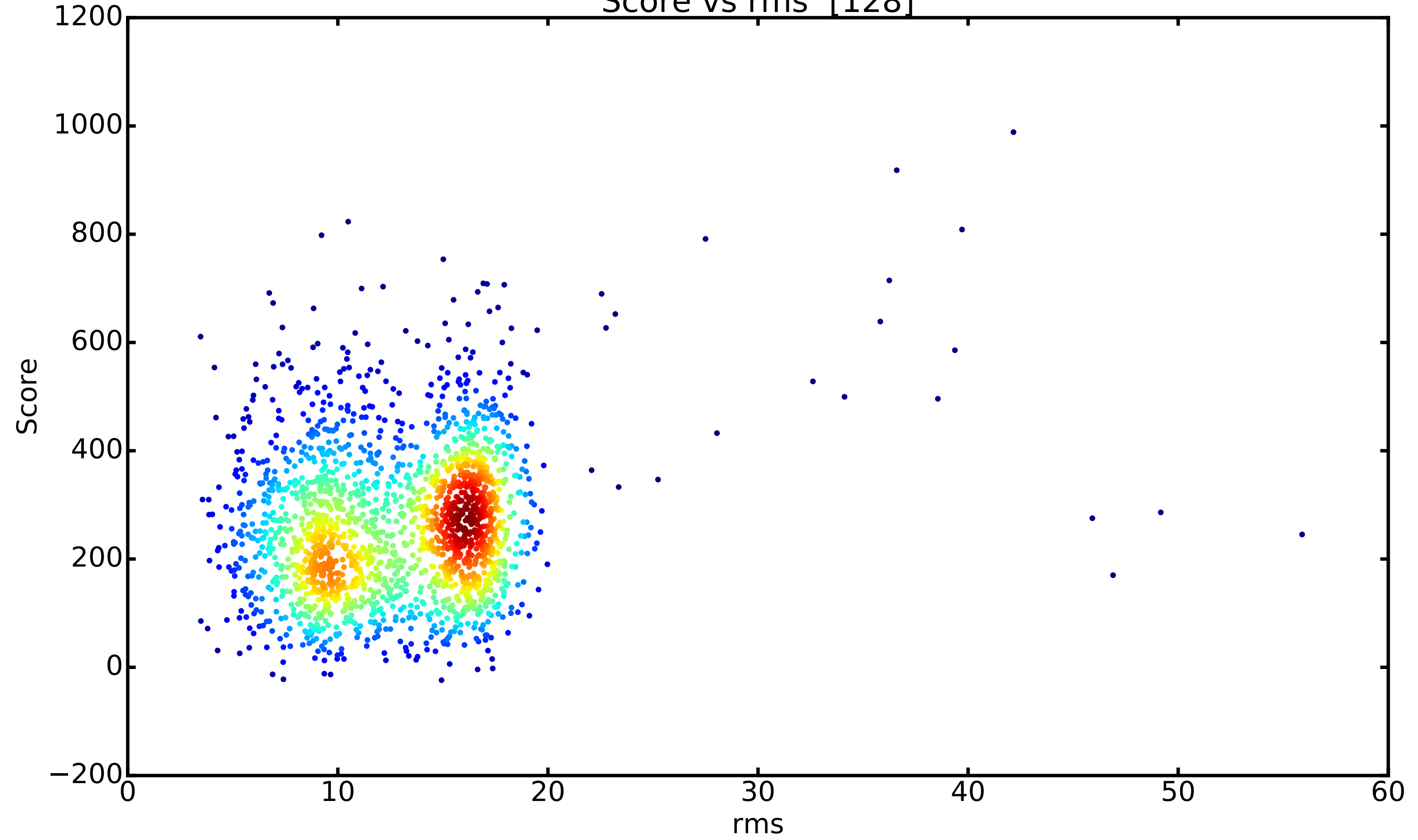
Score vs rms [127]



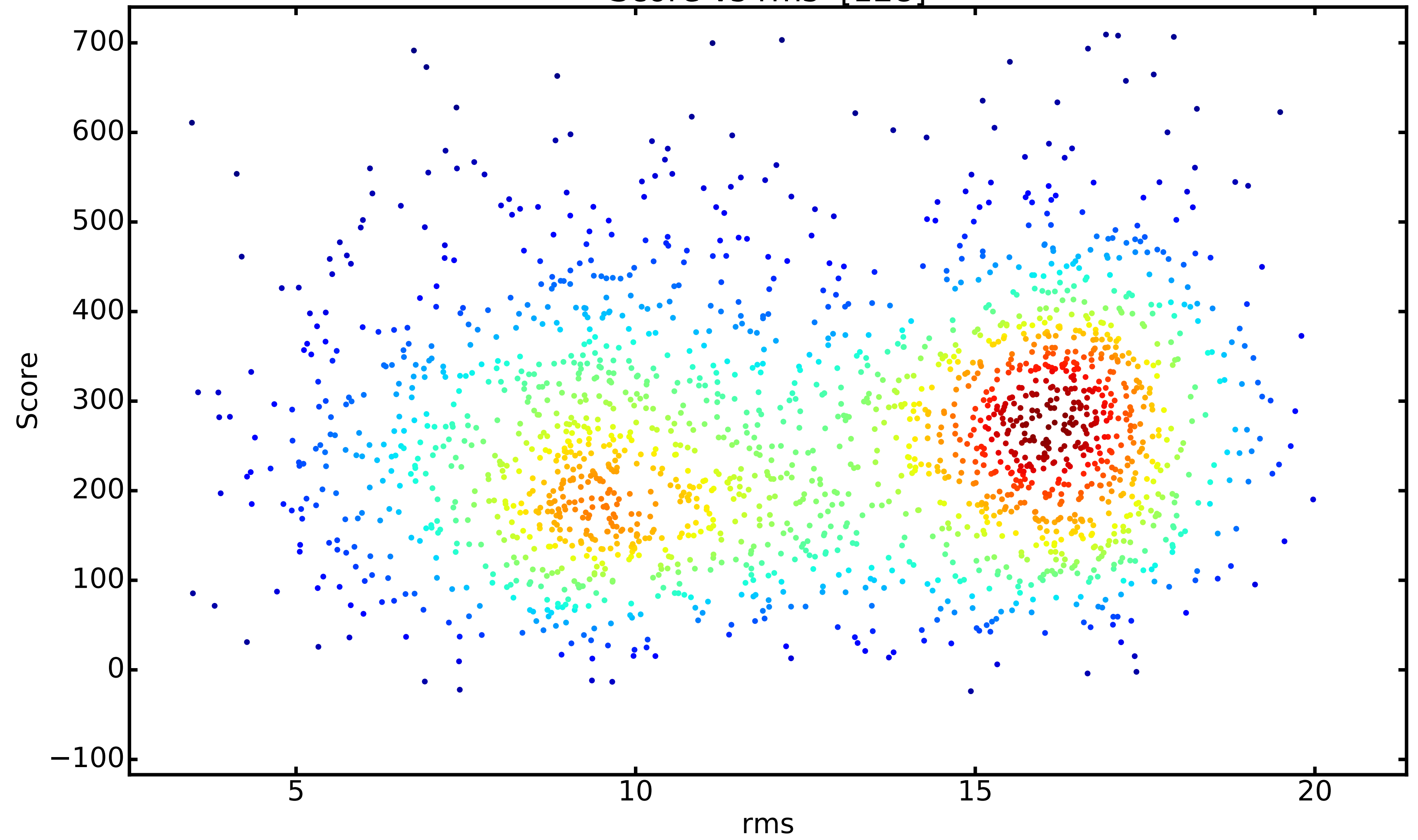
Score vs rms [127]



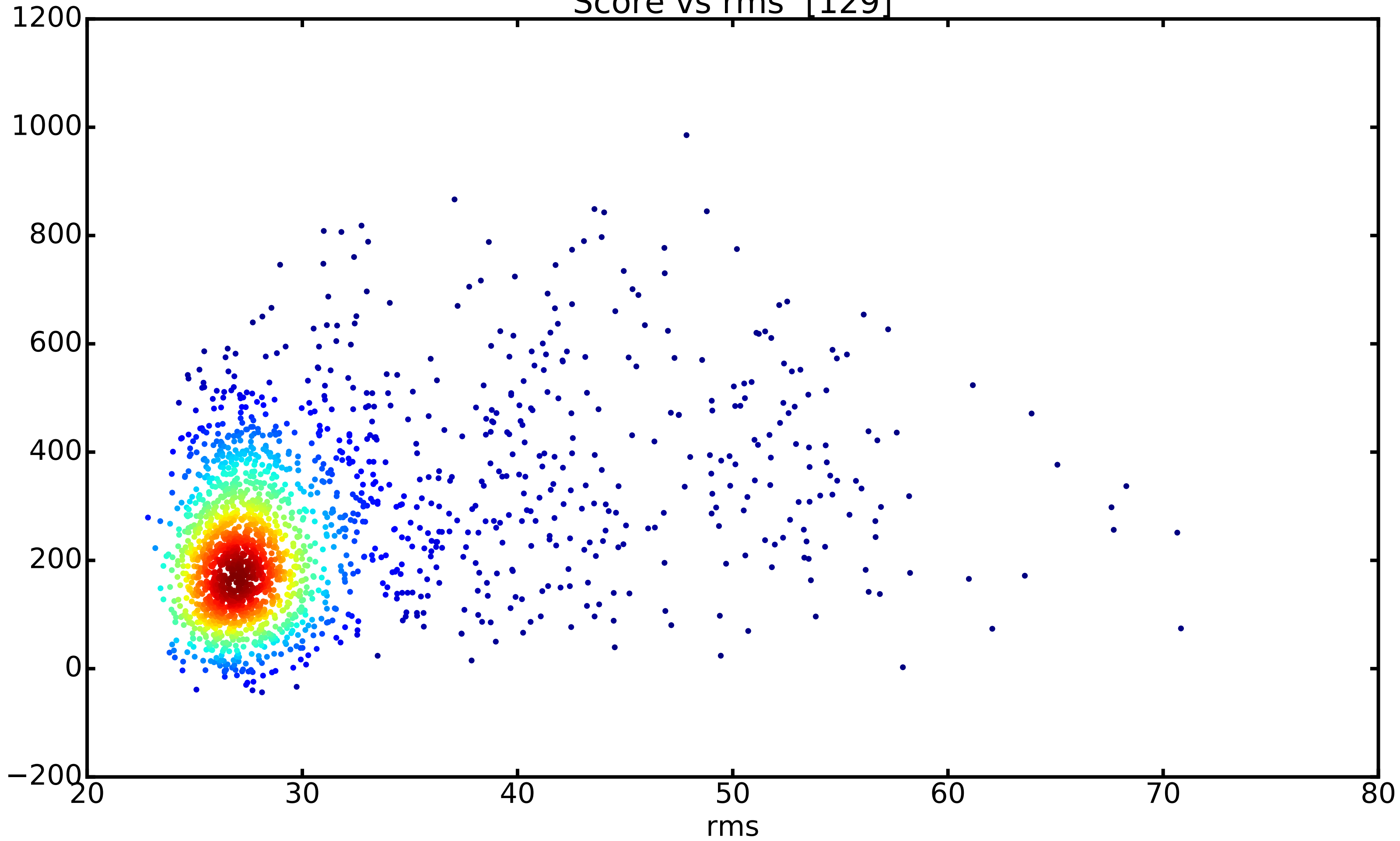
Score vs rms [128]



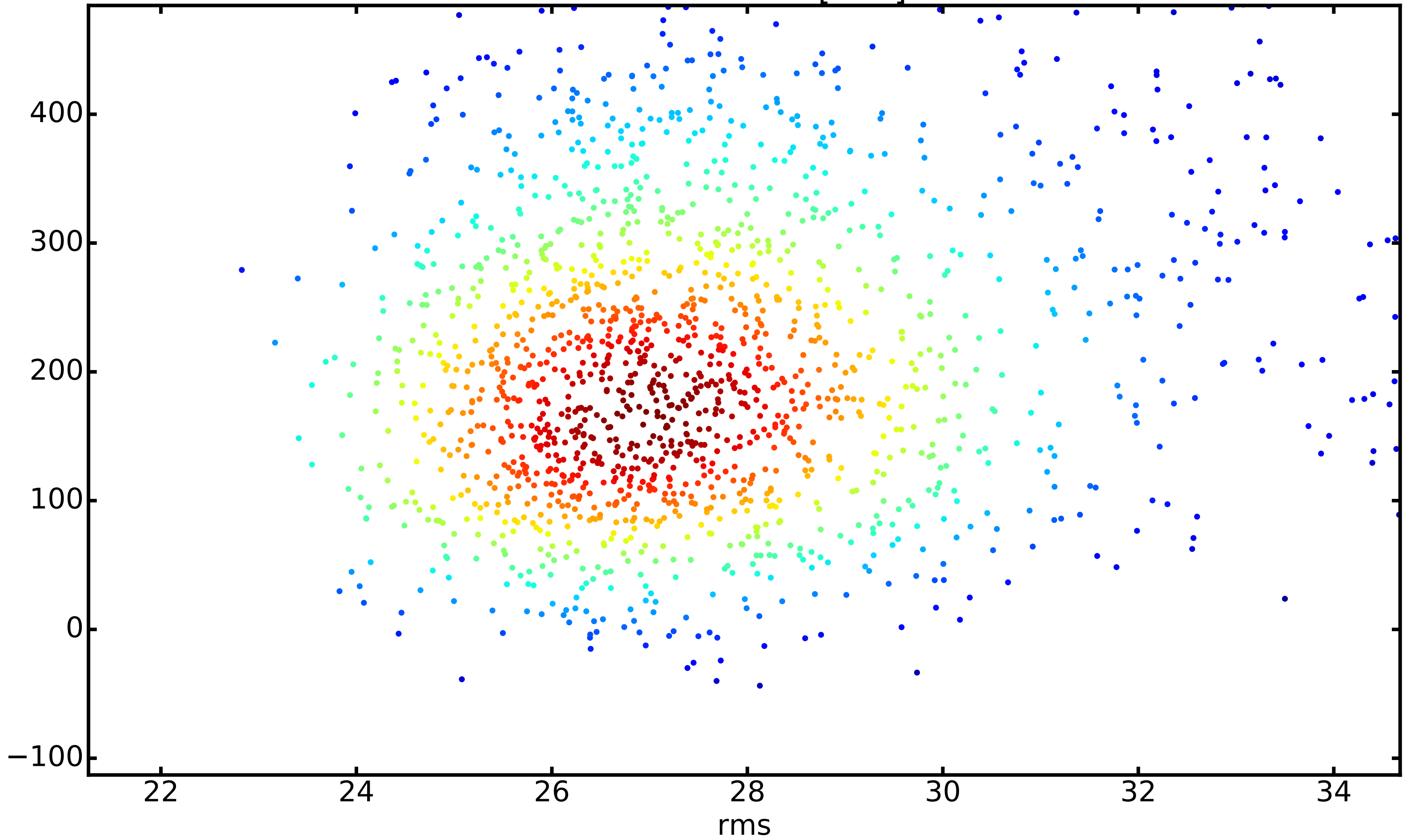
Score vs rms [128]



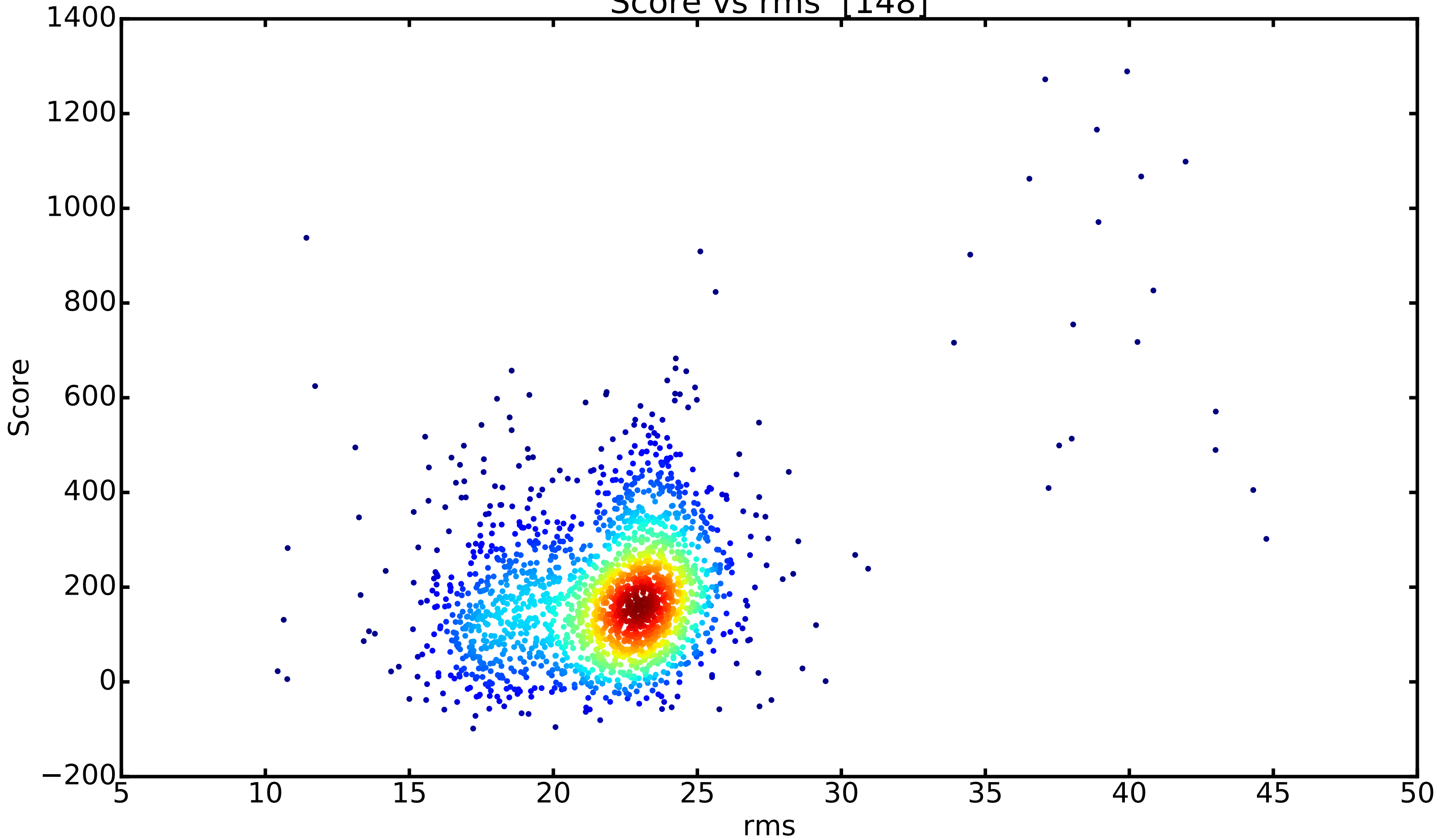
Score vs rms [129]



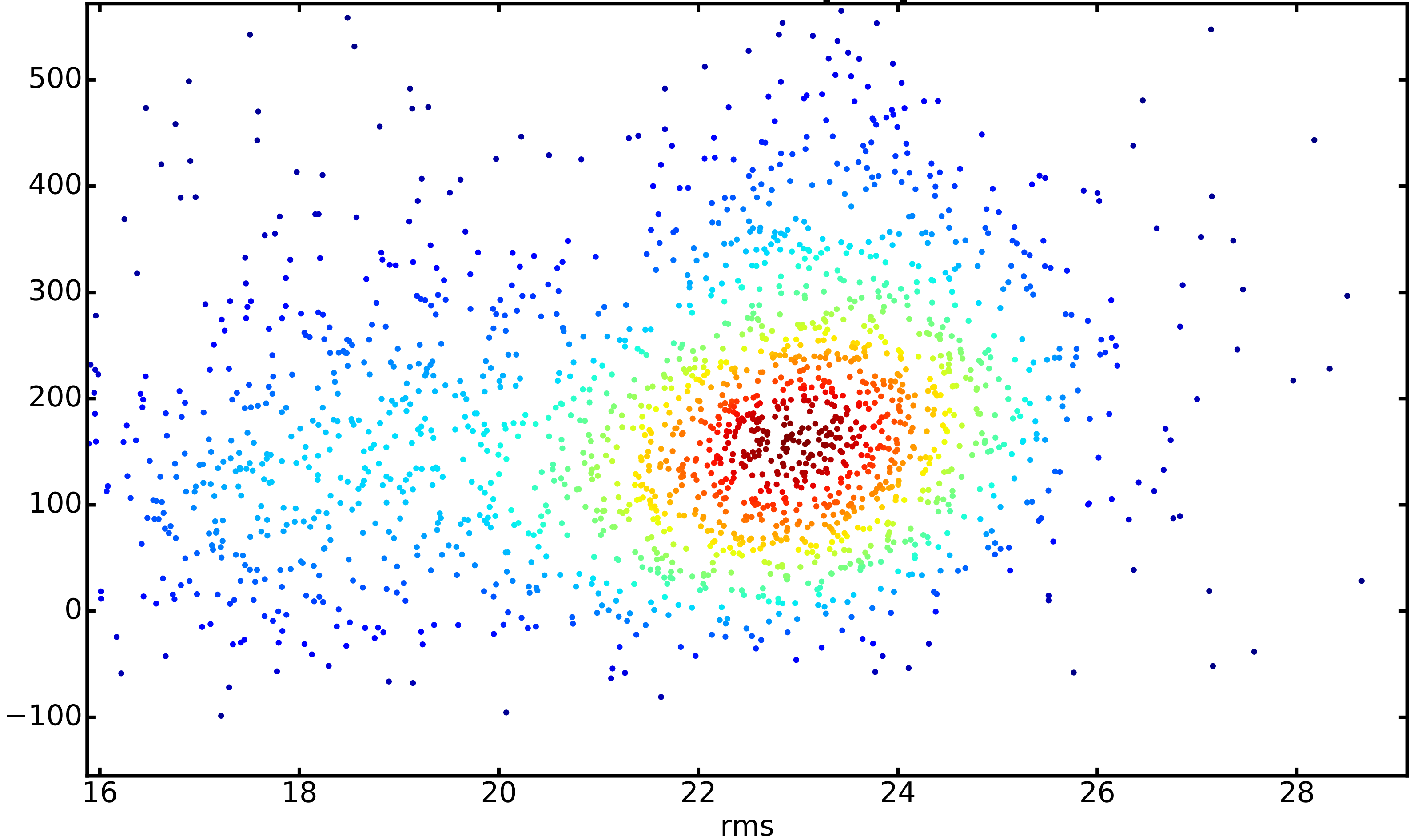
Score vs rms [129]



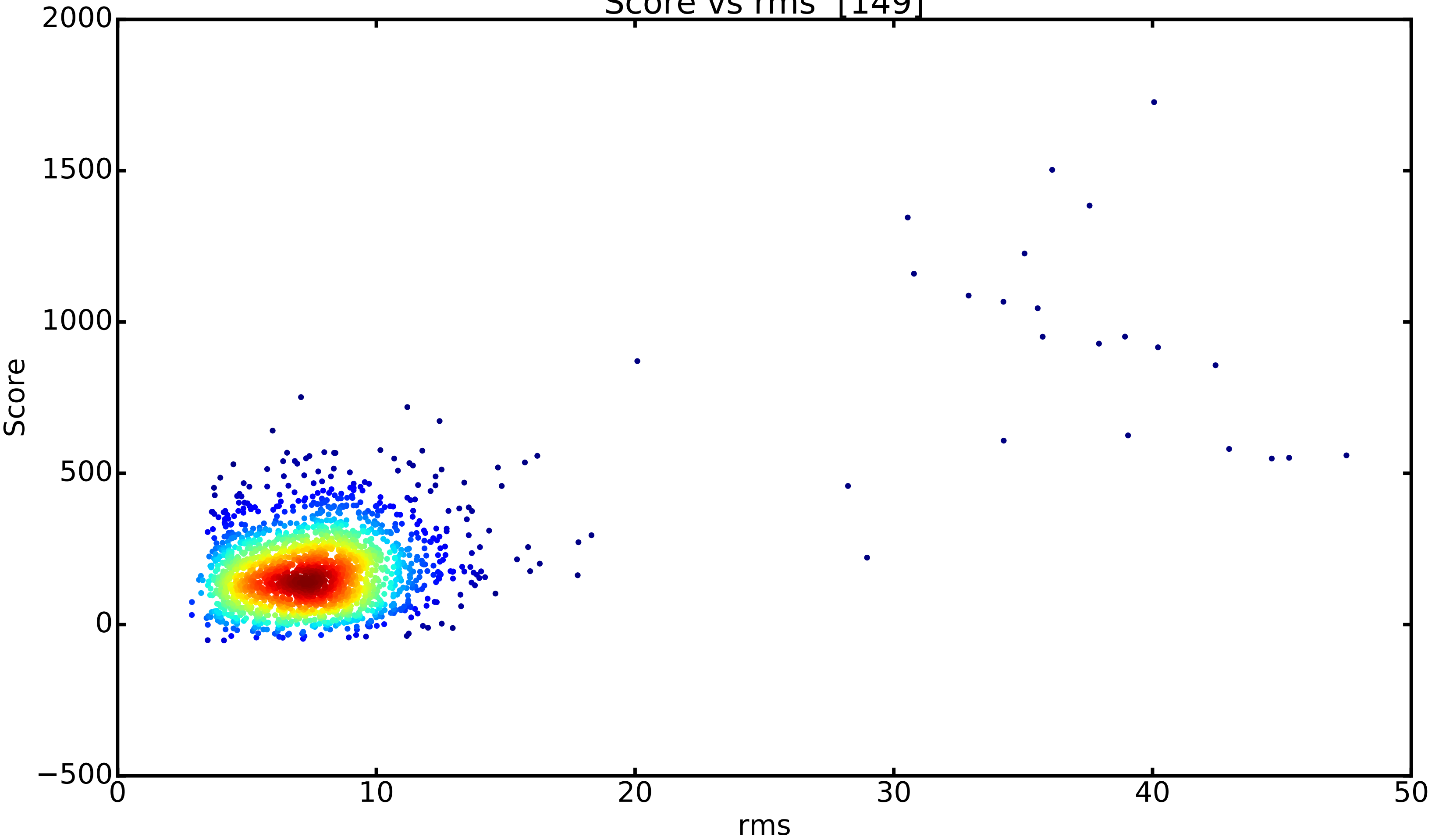
Score vs rms [148]



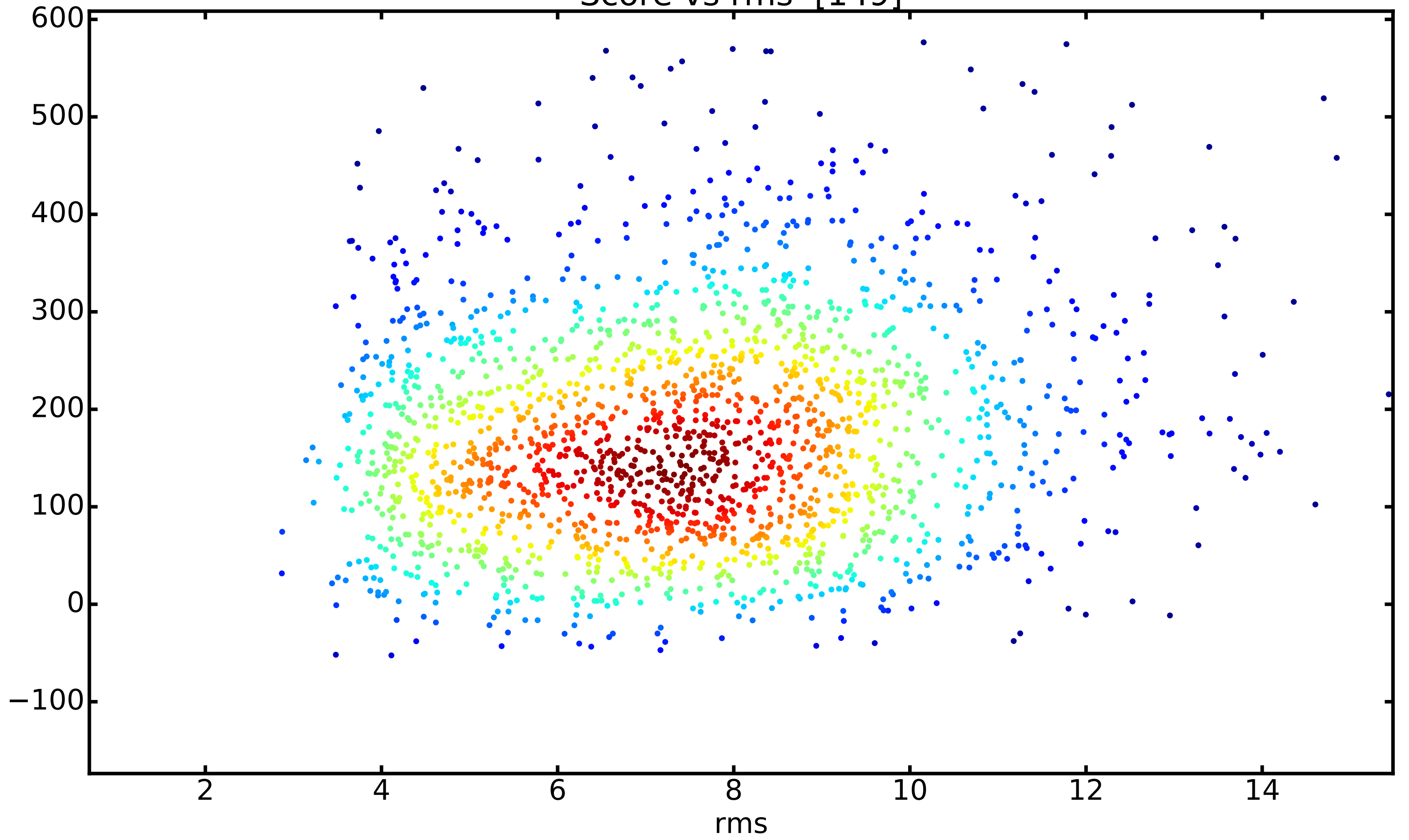
Score vs rms [148]



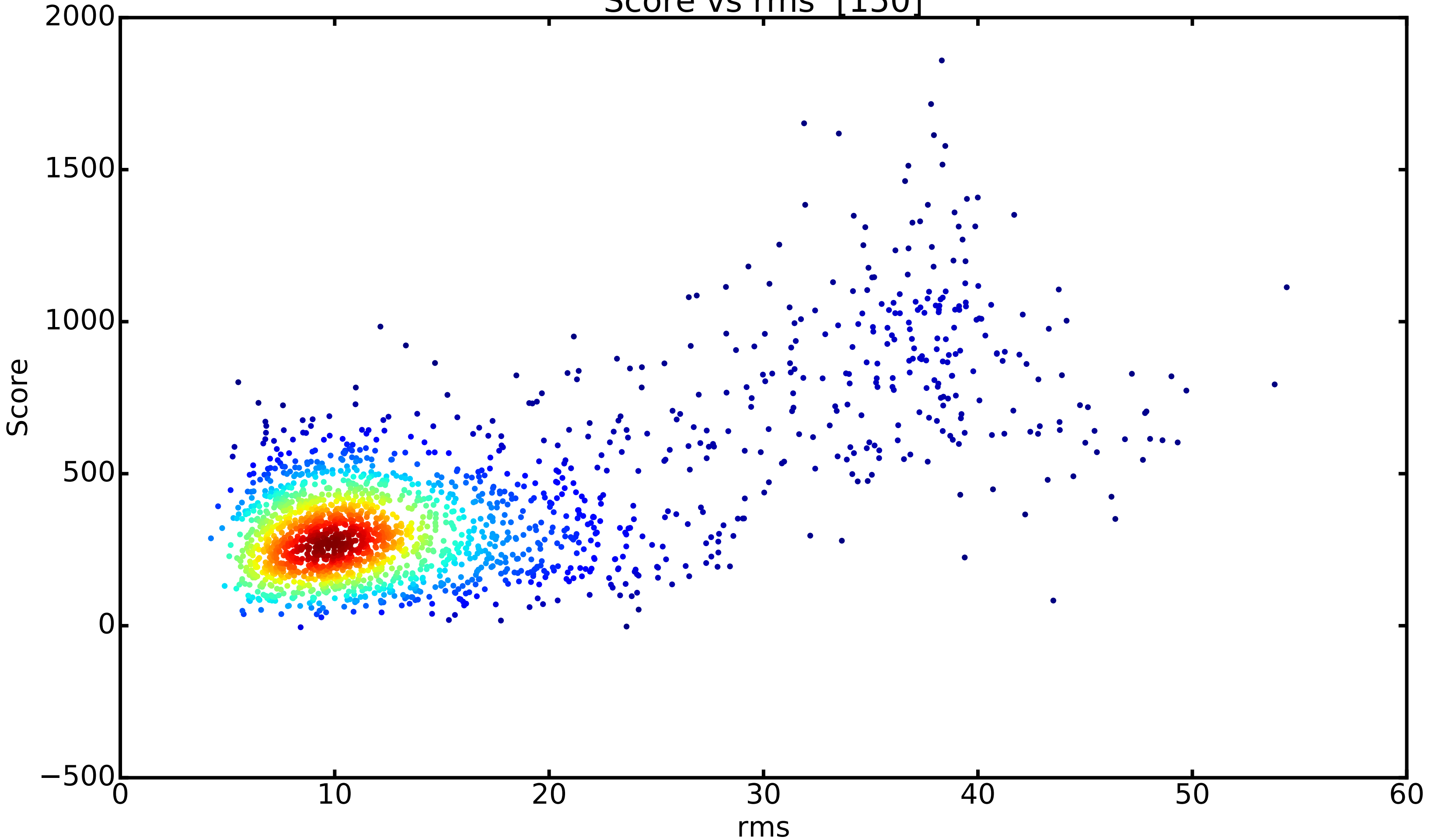
Score vs rms [149]



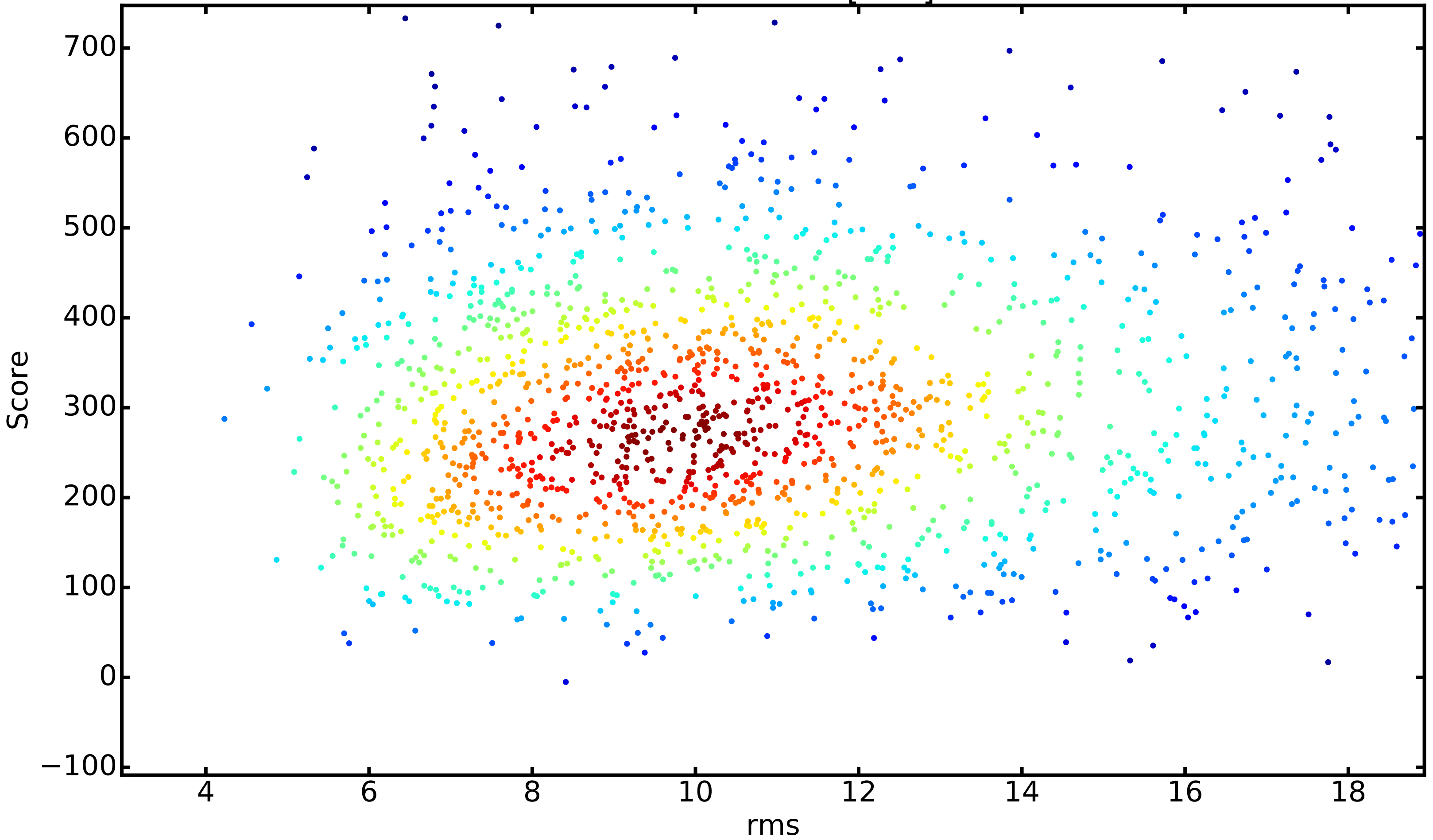
Score vs rms [149]



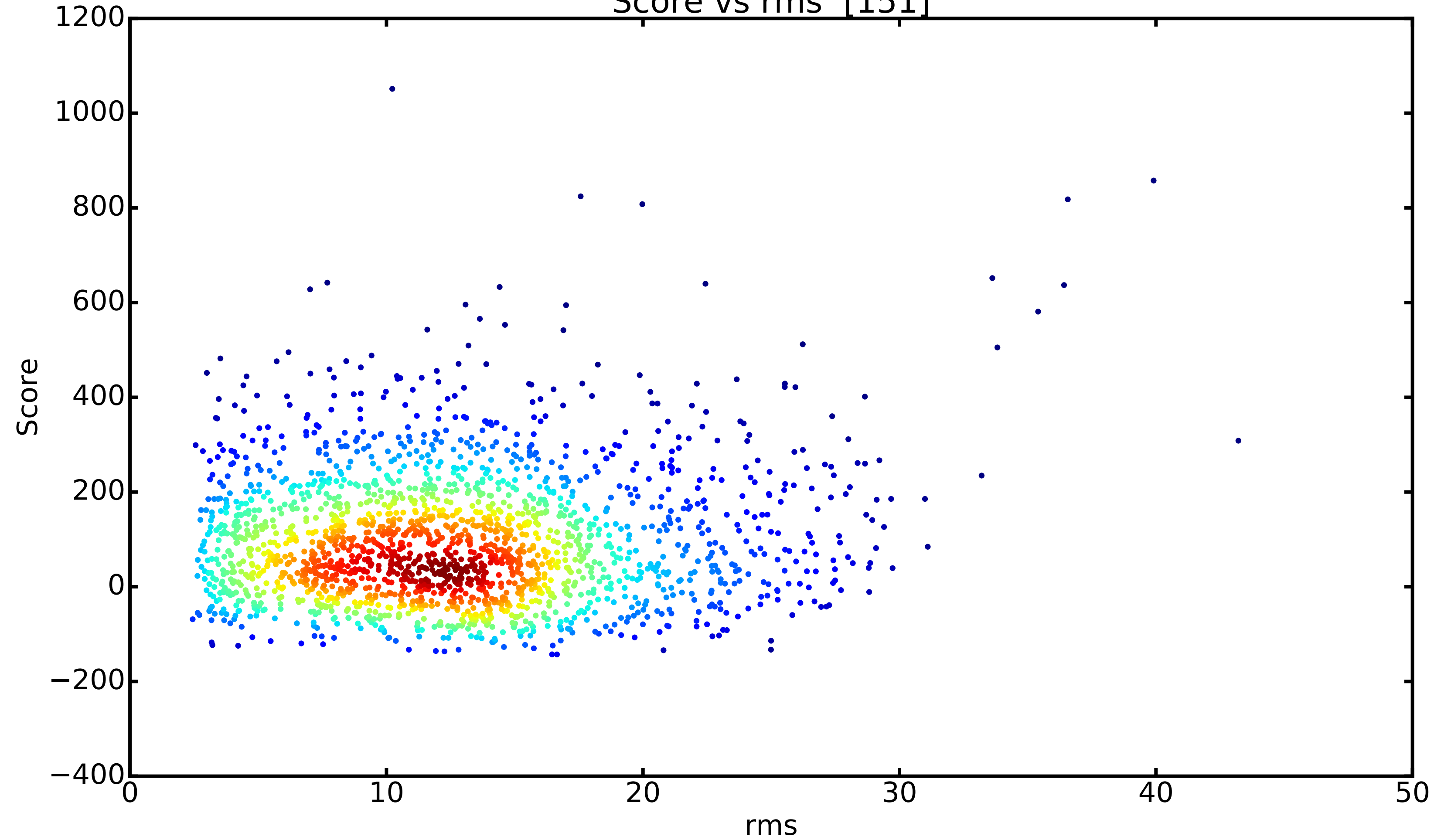
Score vs rms [150]

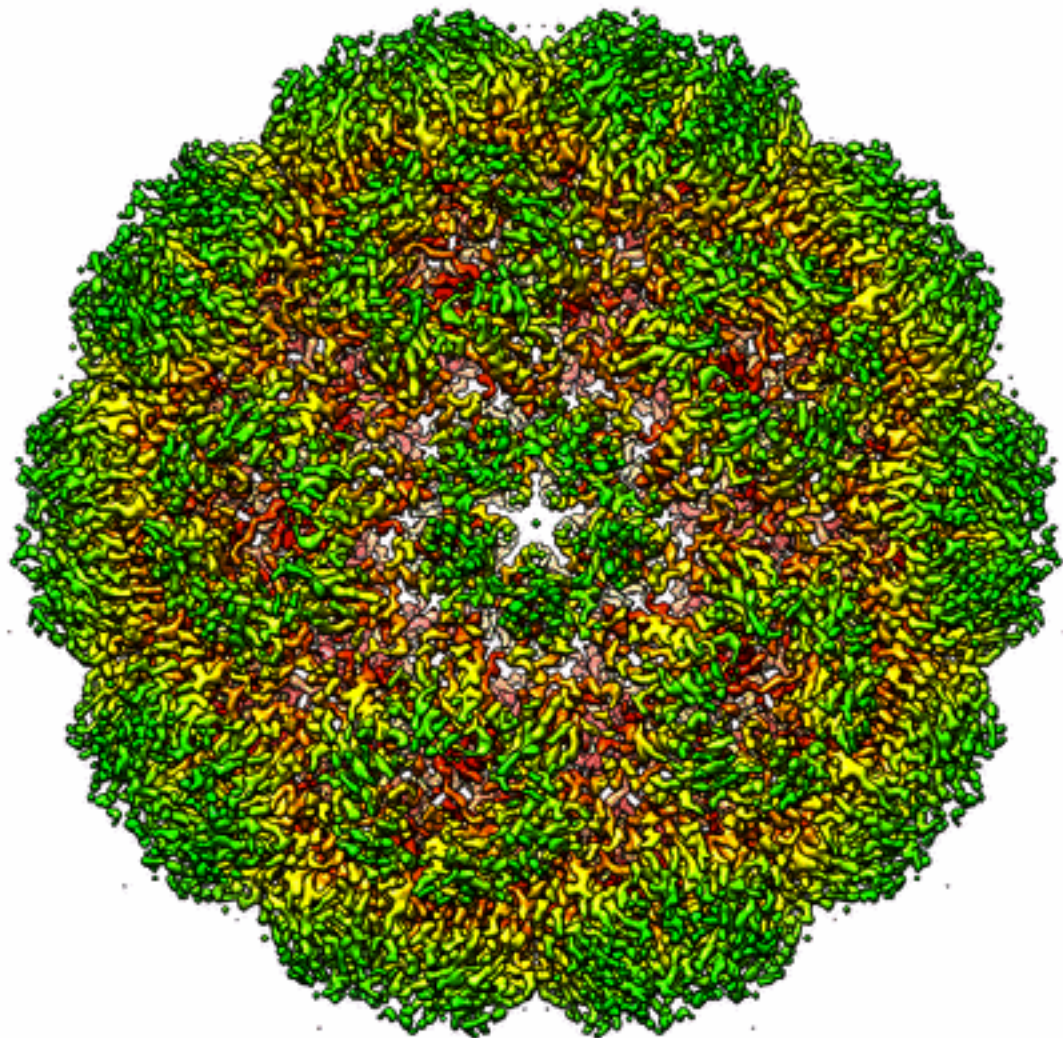


Score vs rms [150]

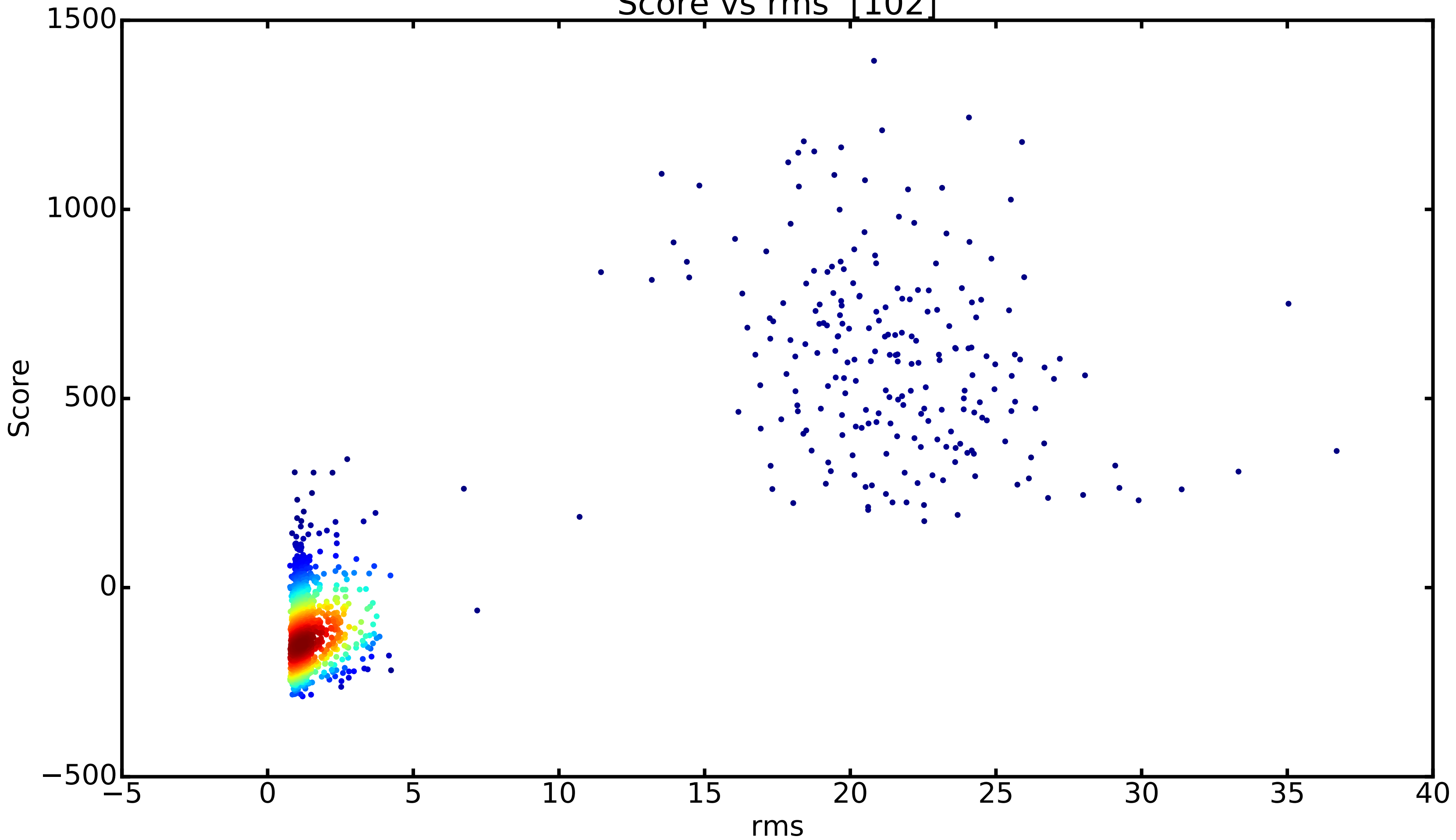


Score vs rms [151]

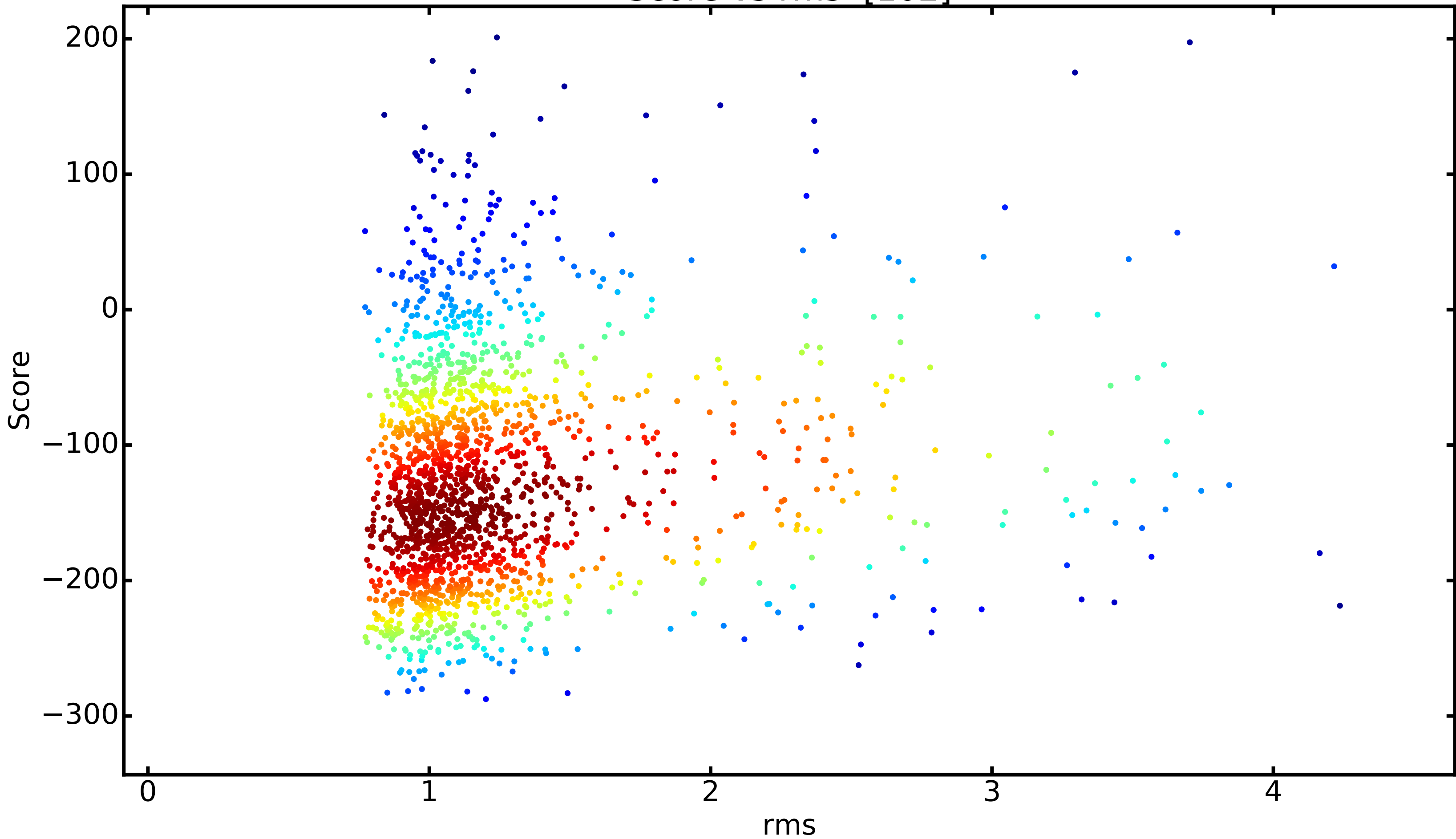




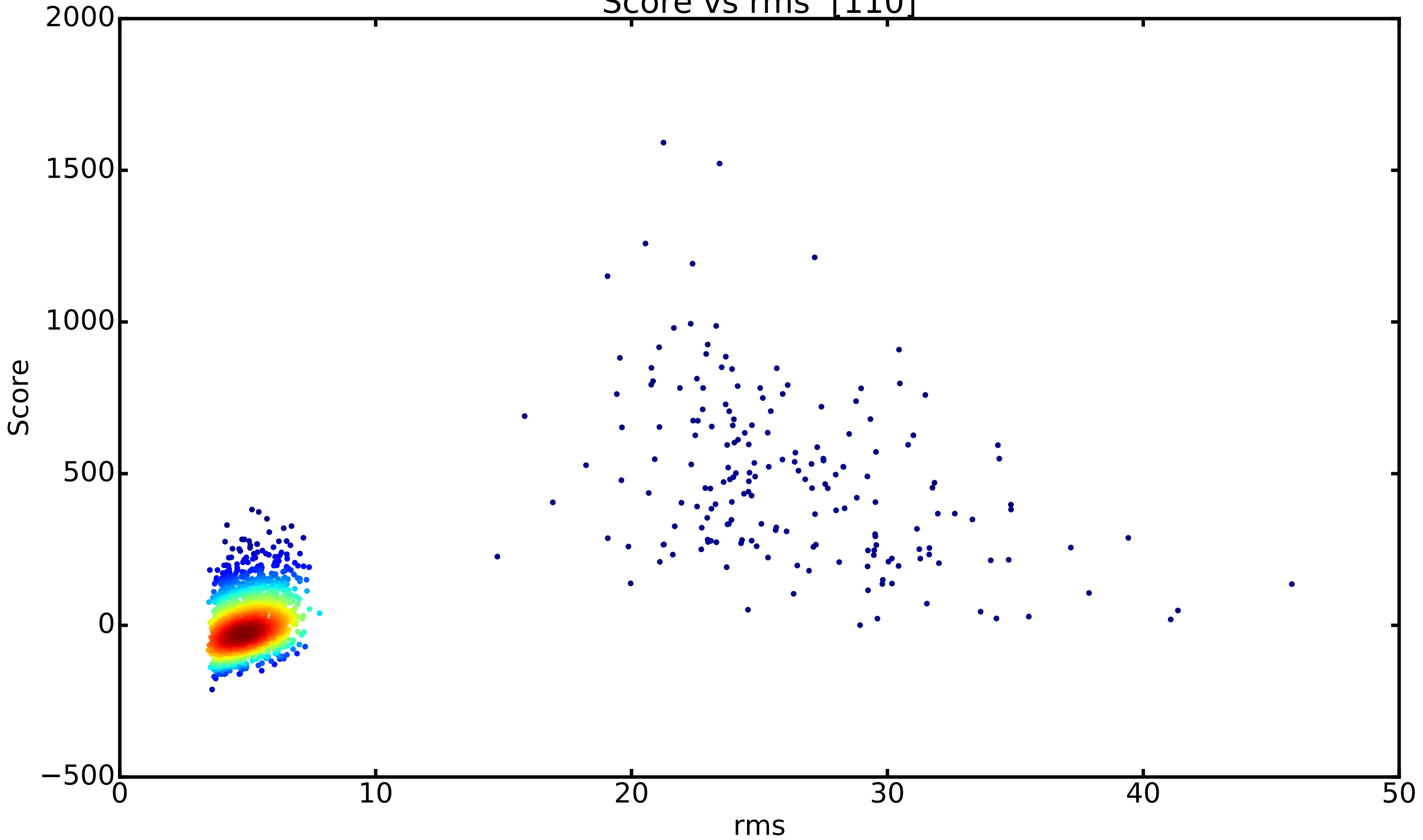
Score vs rms [102]



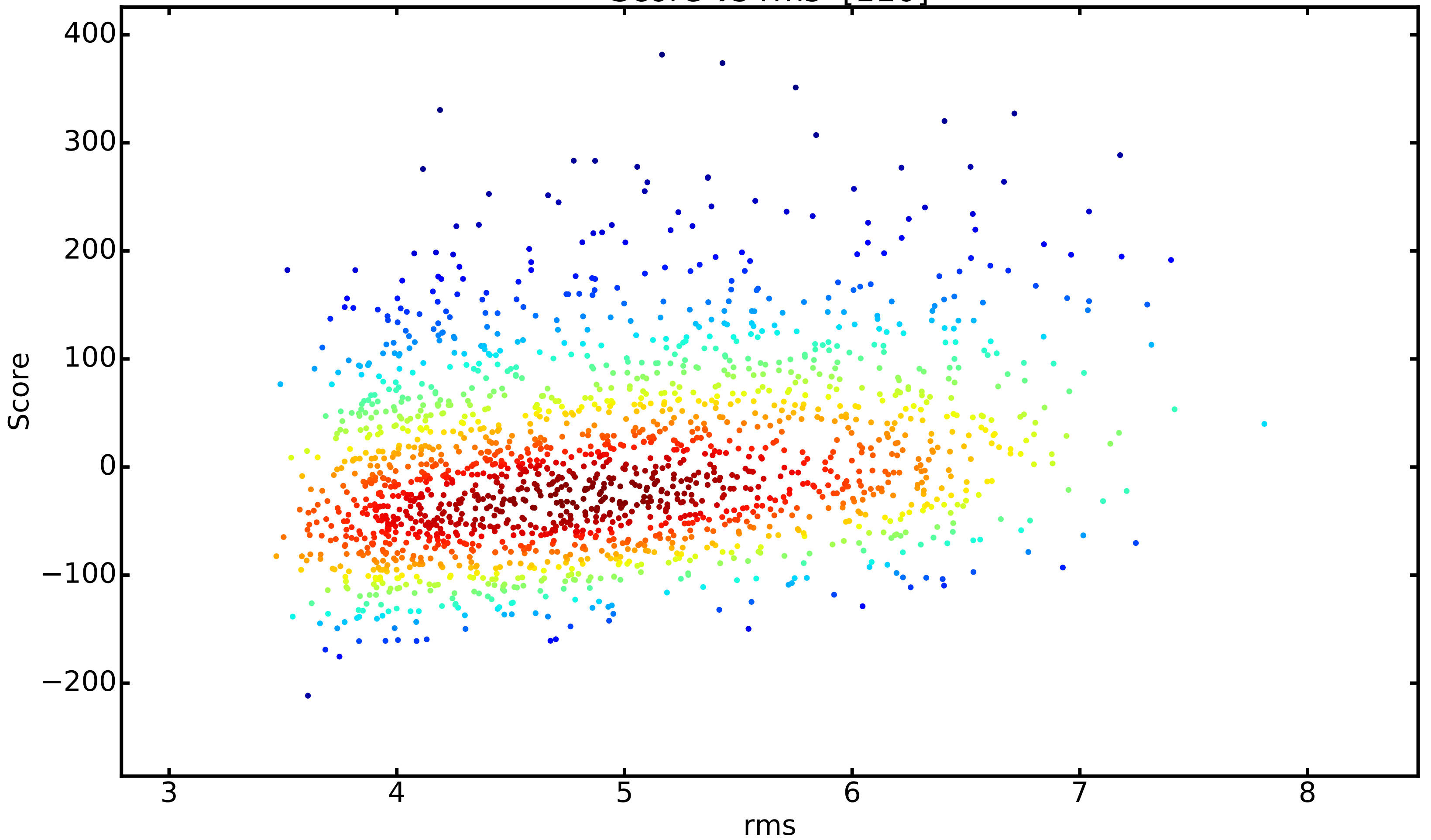
Score vs rms [102]



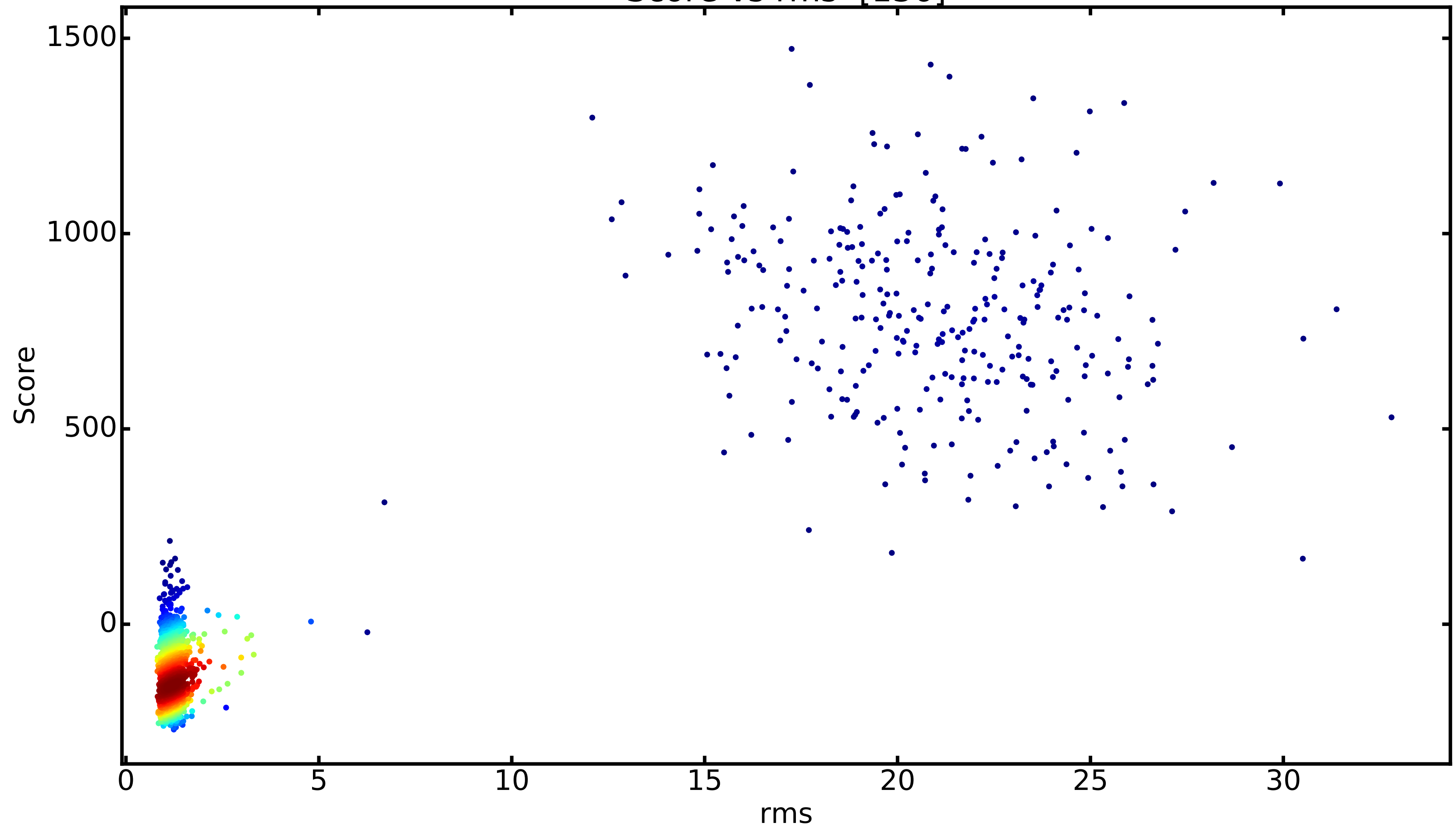
Score vs rms [110]



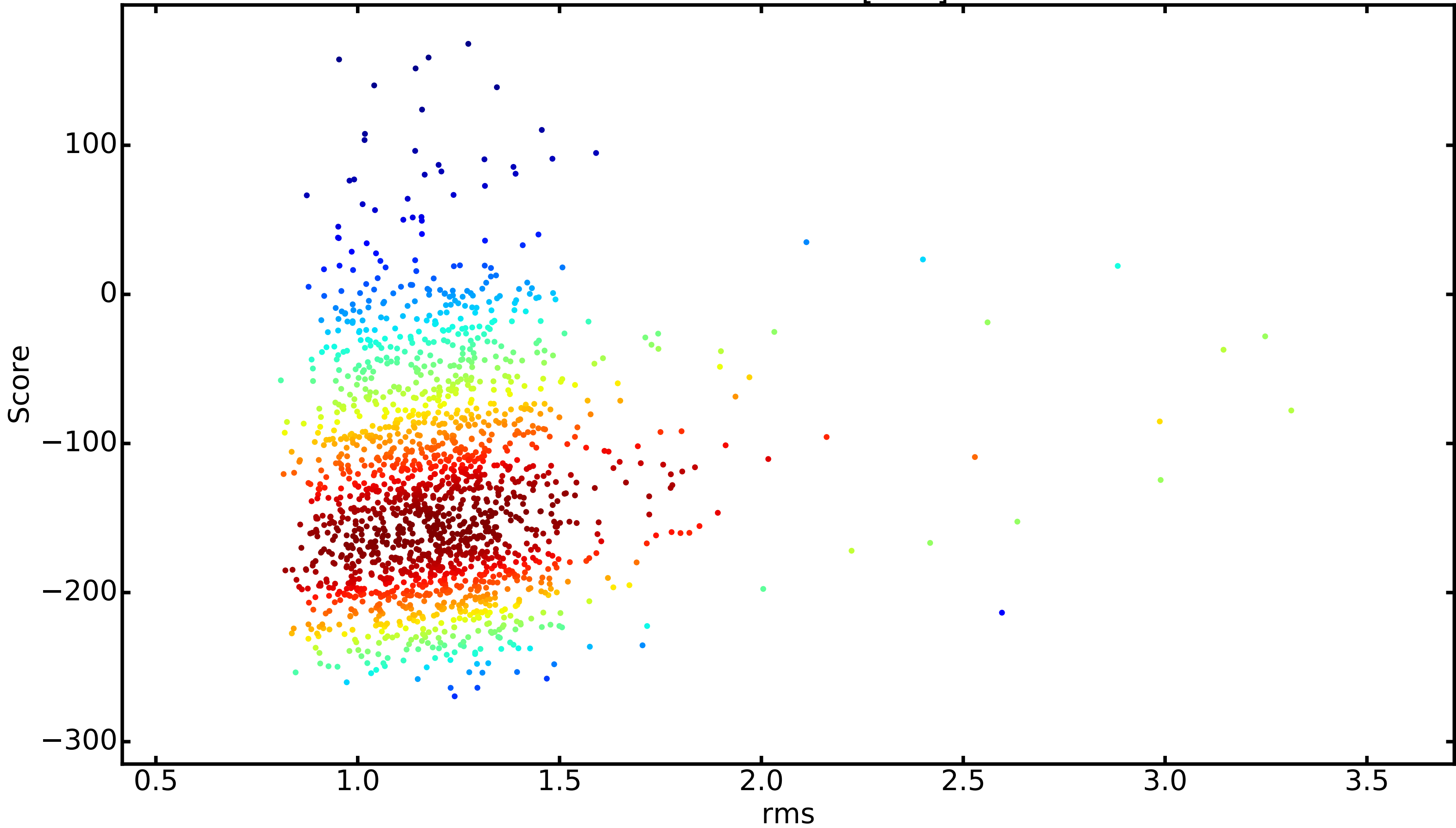
Score vs rms [110]



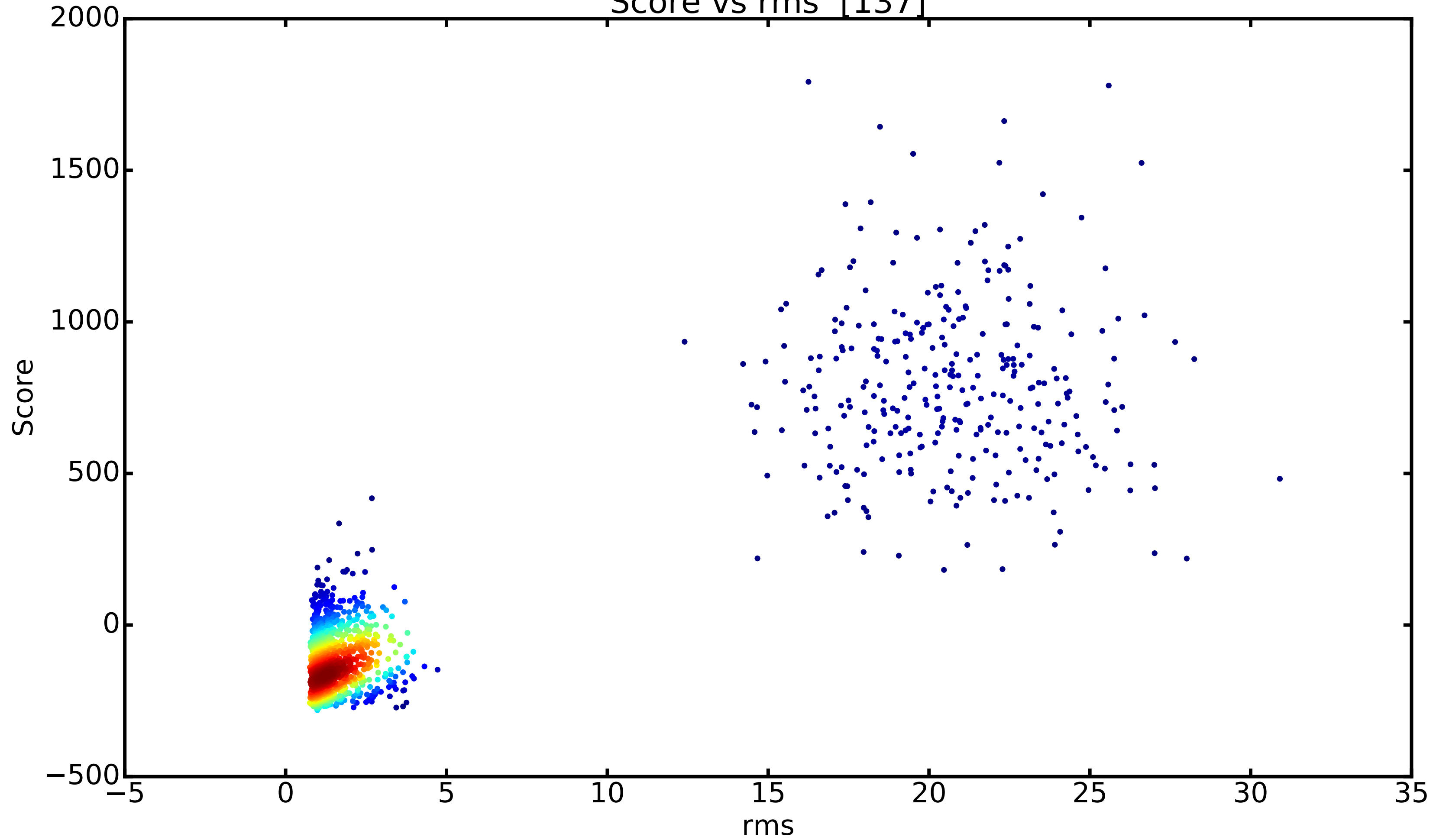
Score vs rms [136]



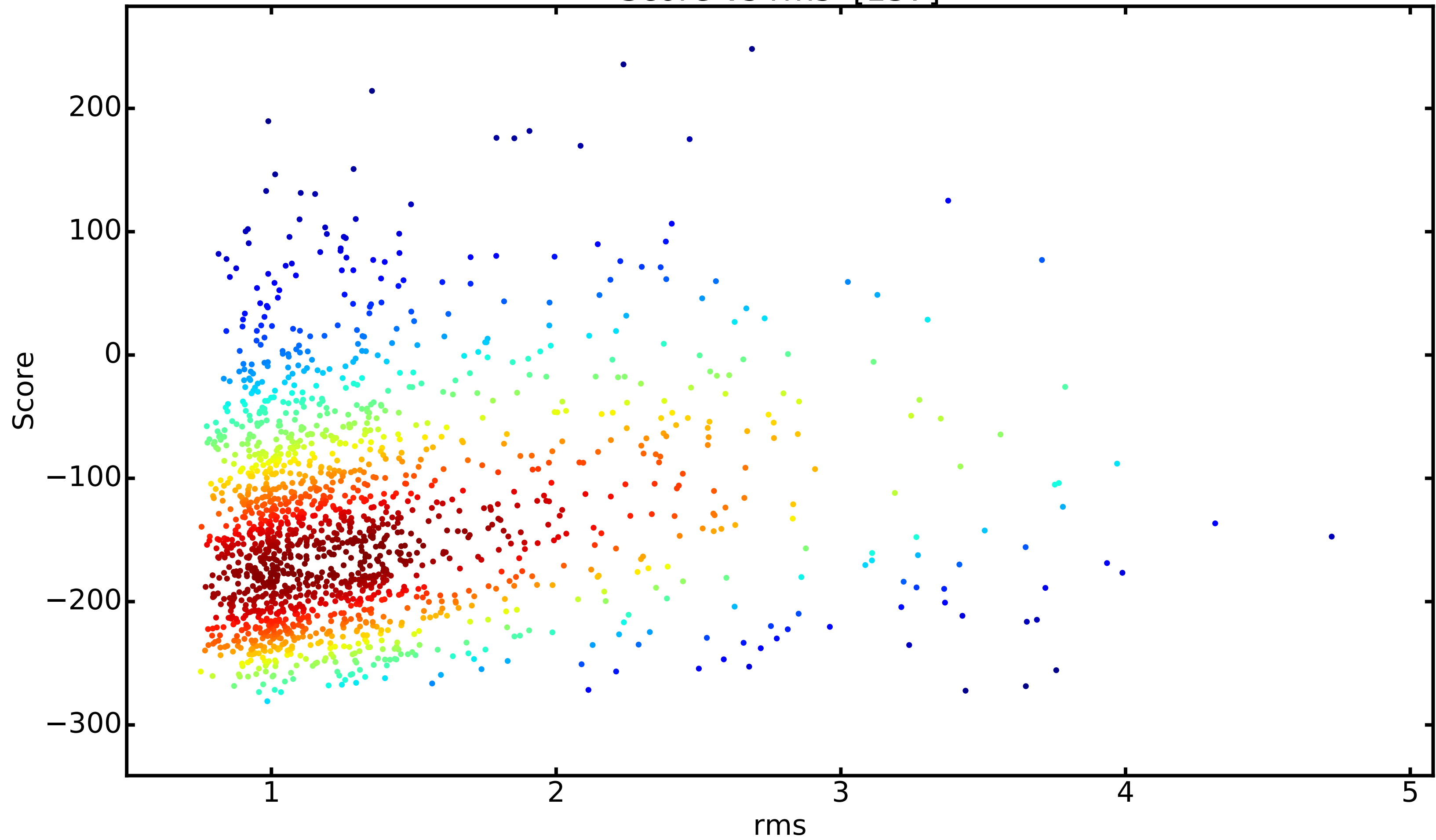
Score vs rms [136]



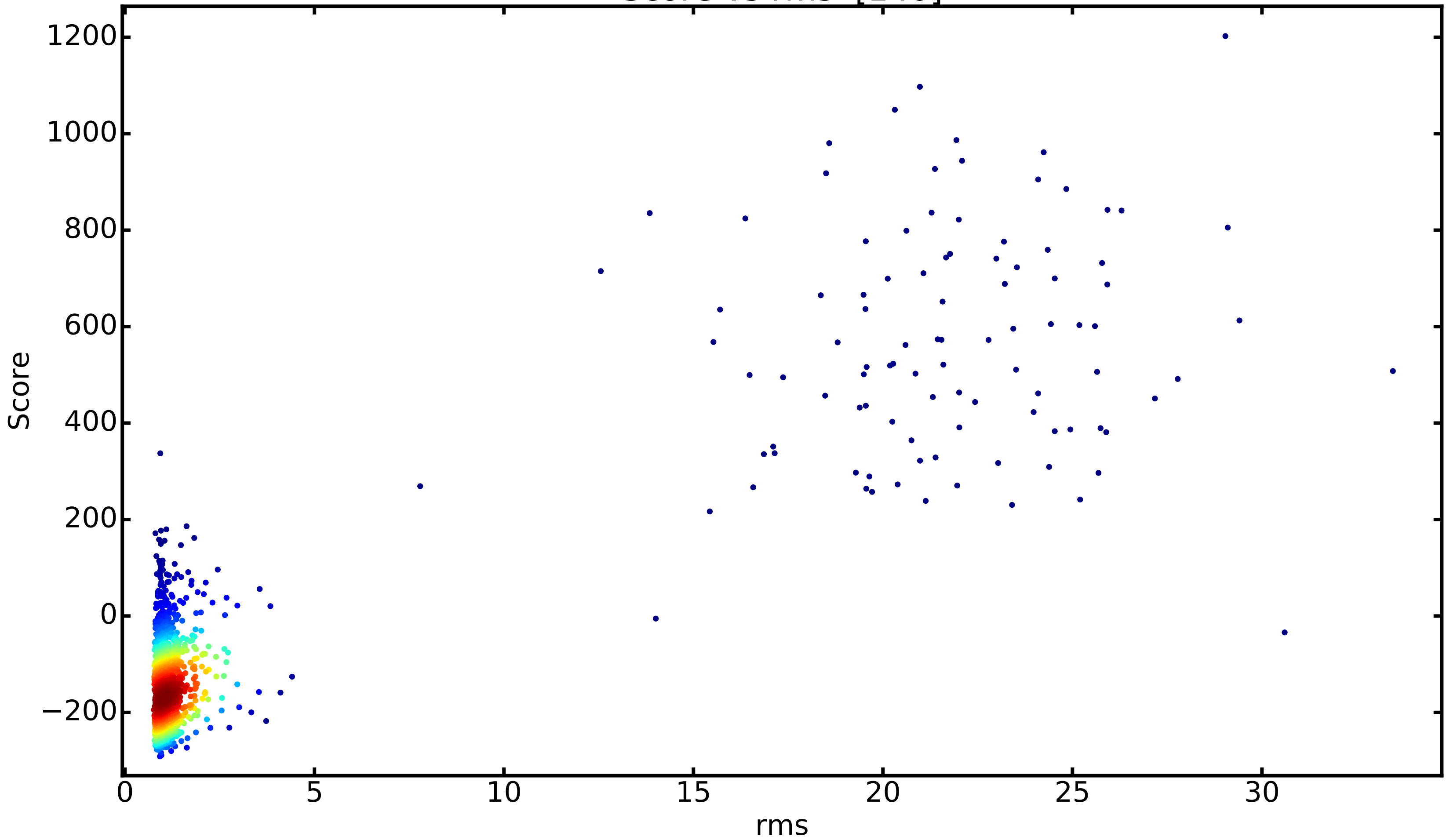
Score vs rms [137]



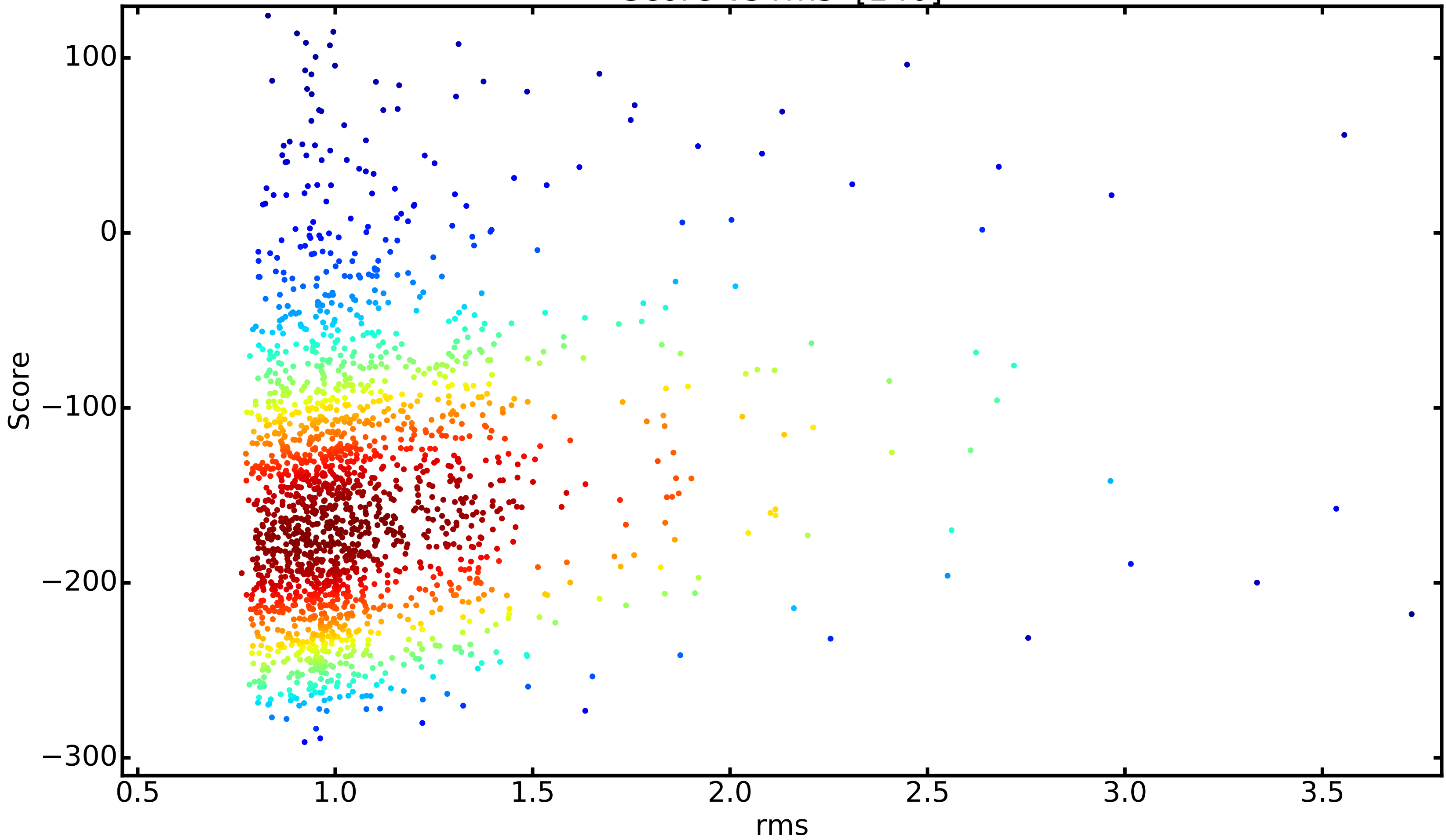
Score vs rms [137]



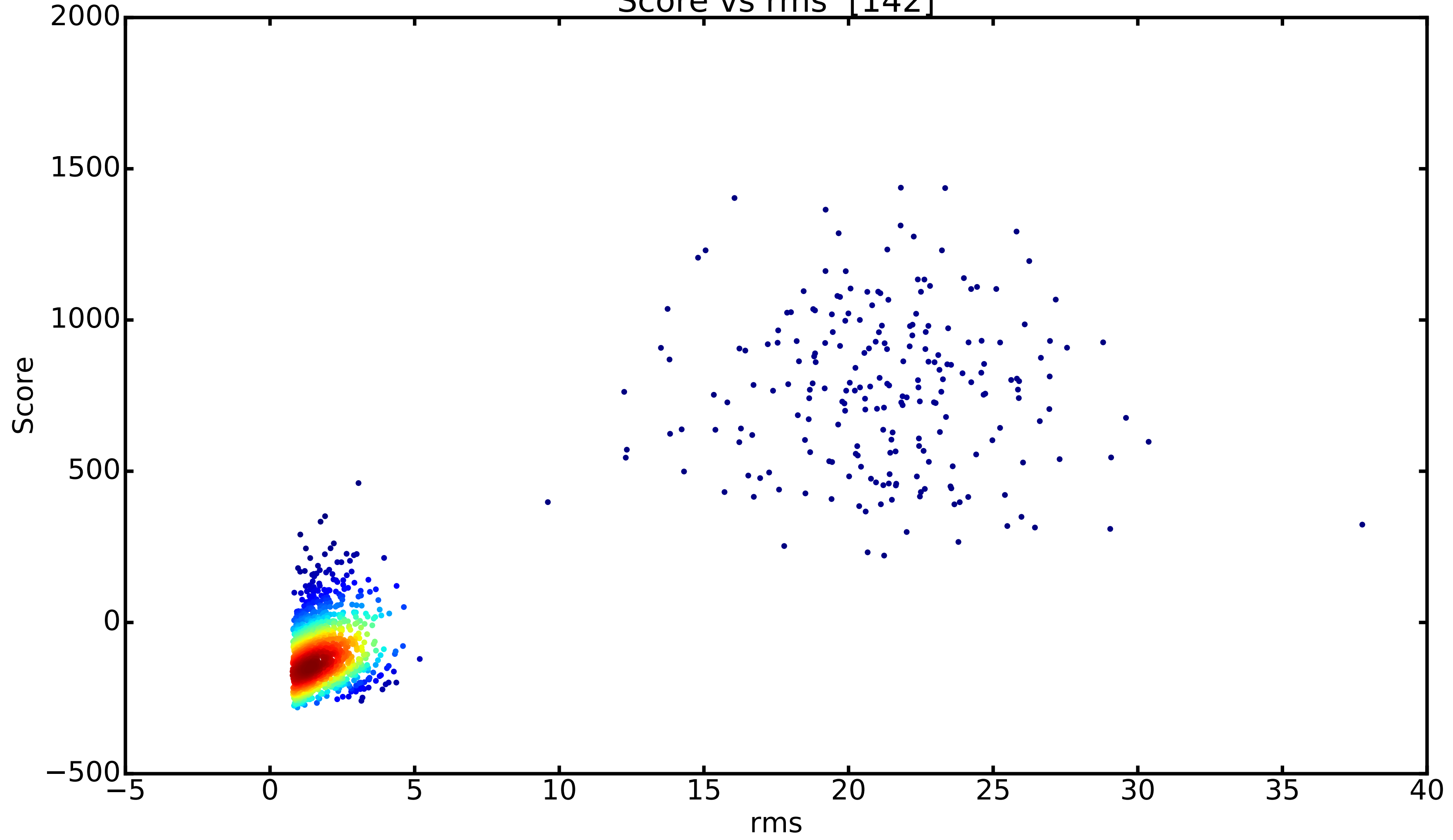
Score vs rms [140]



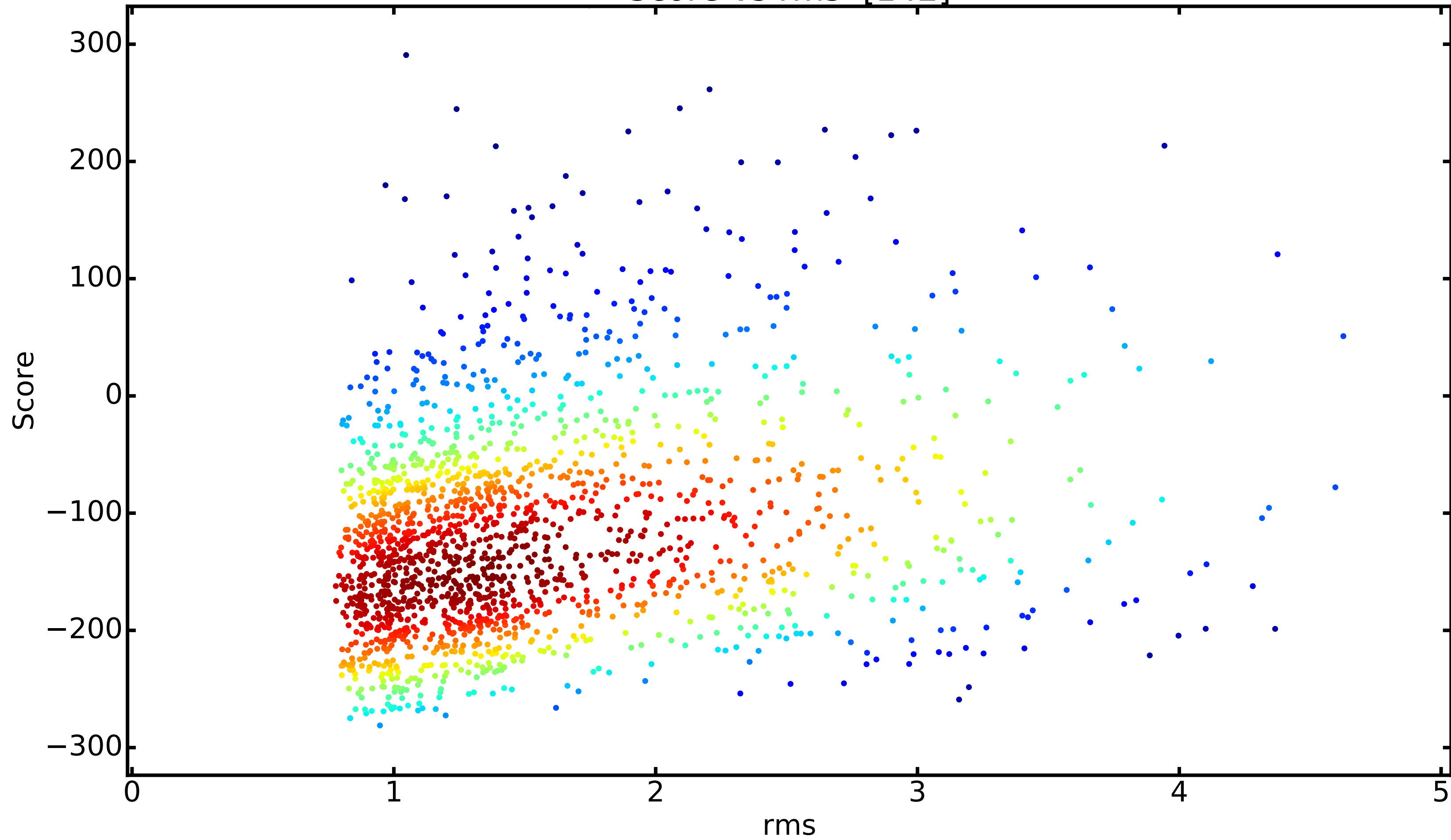
Score vs rms [140]



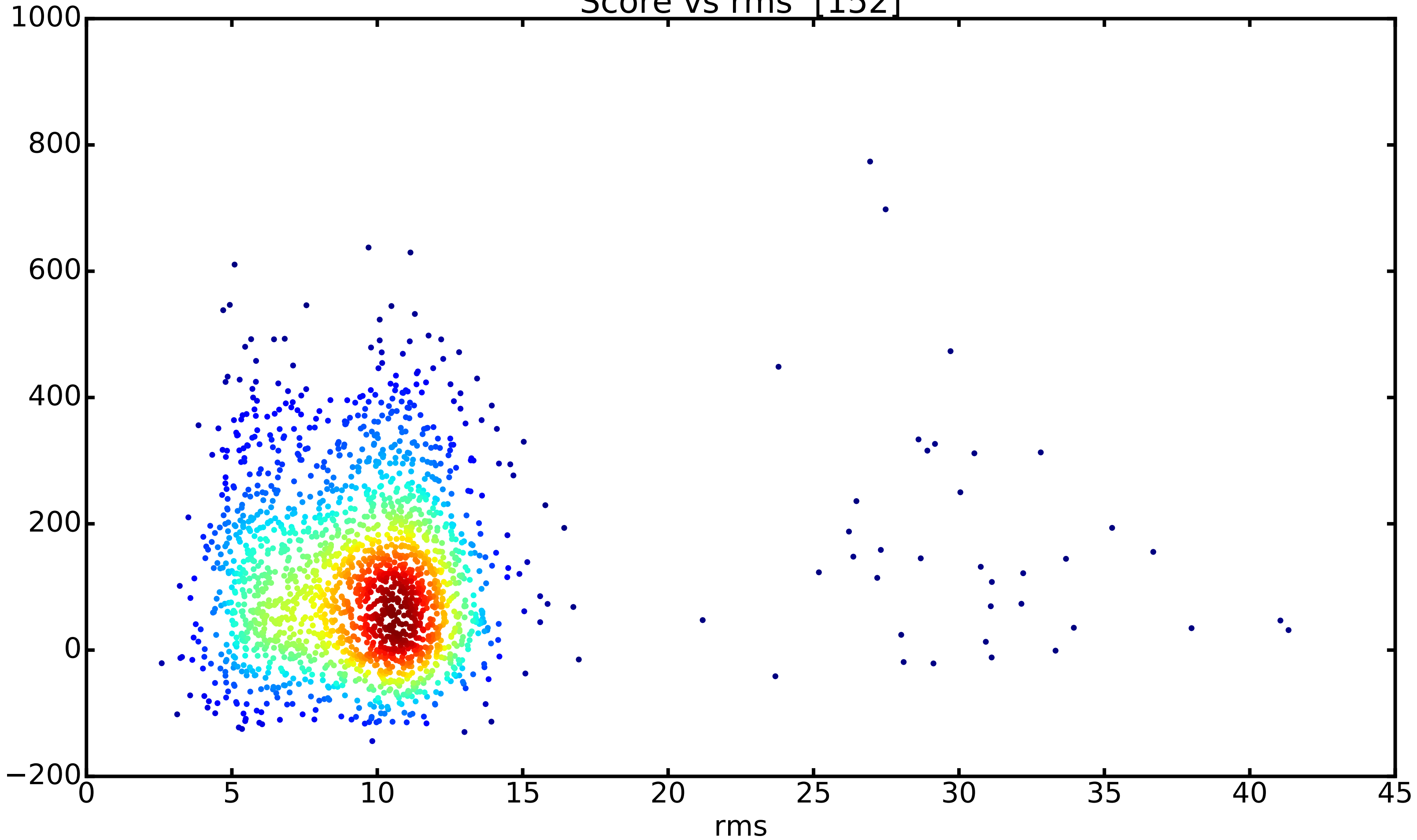
Score vs rms [142]

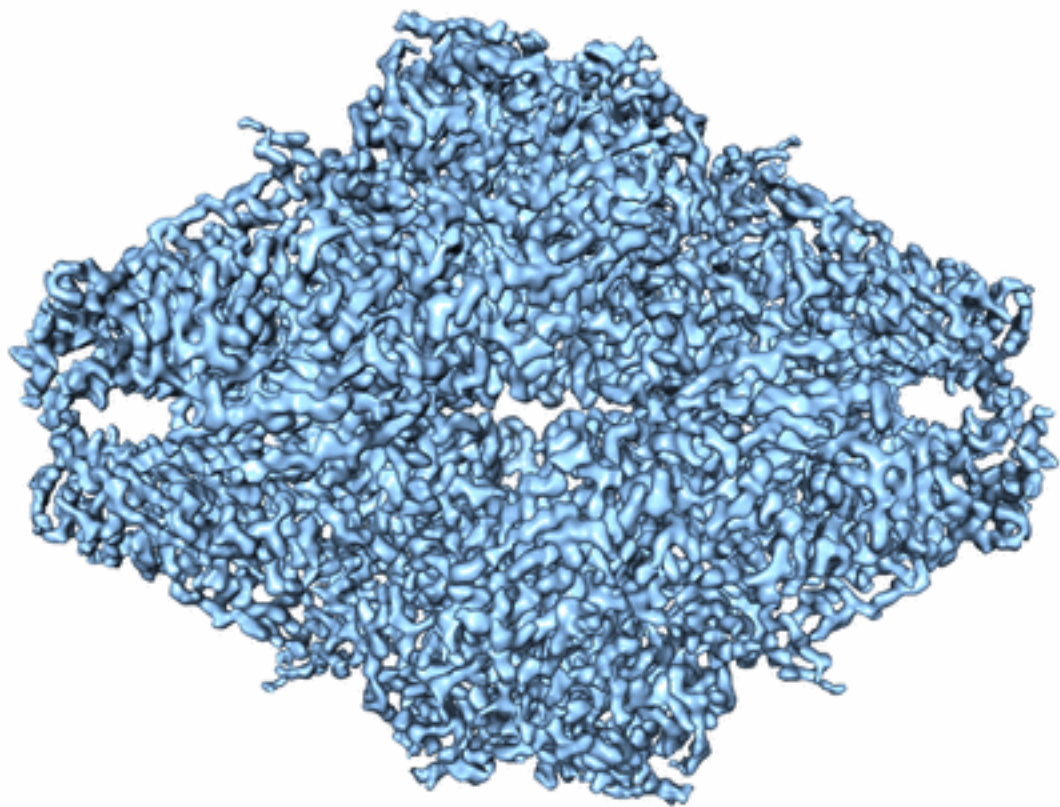


Score vs rms [142]

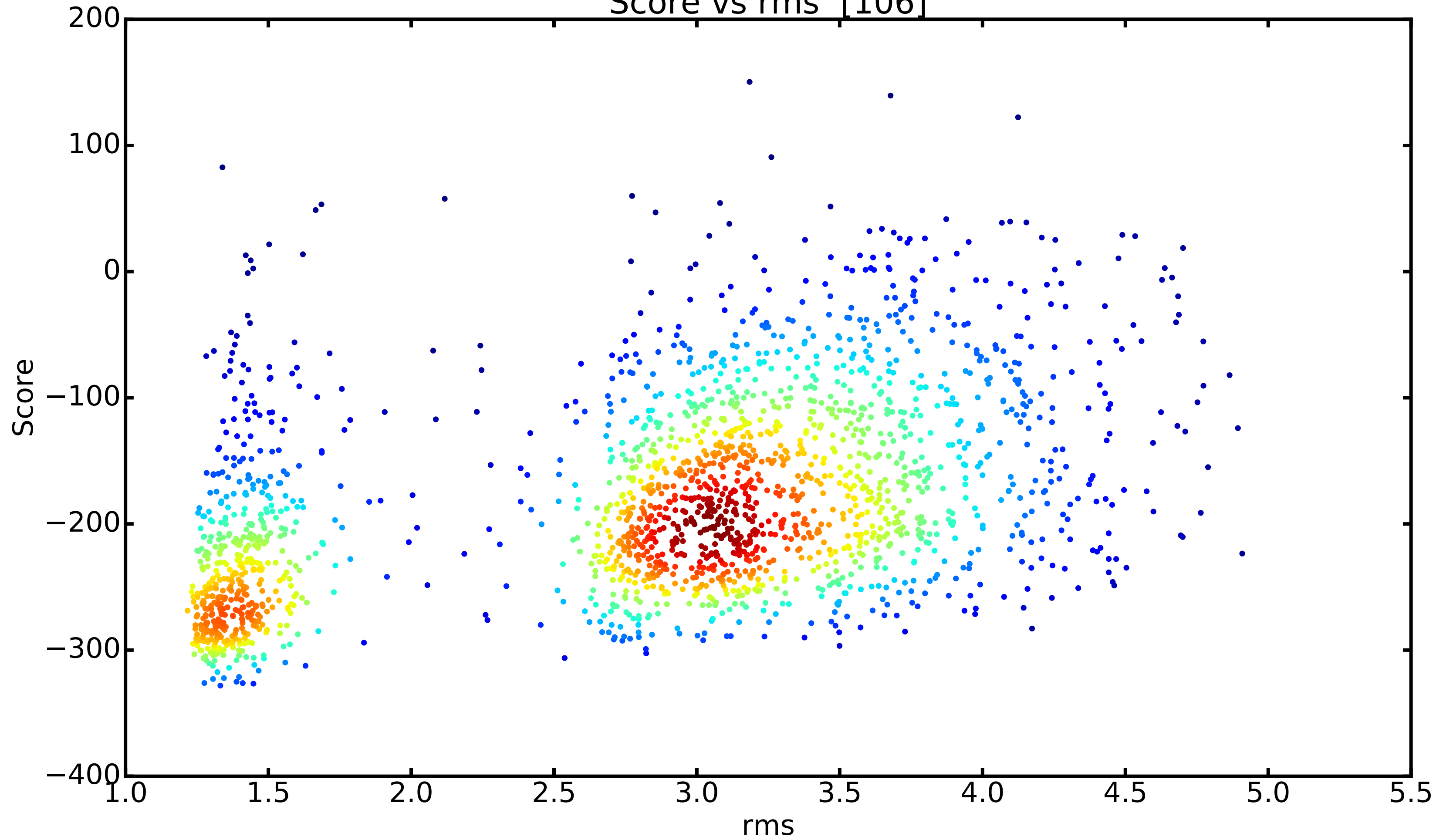


Score vs rms [152]

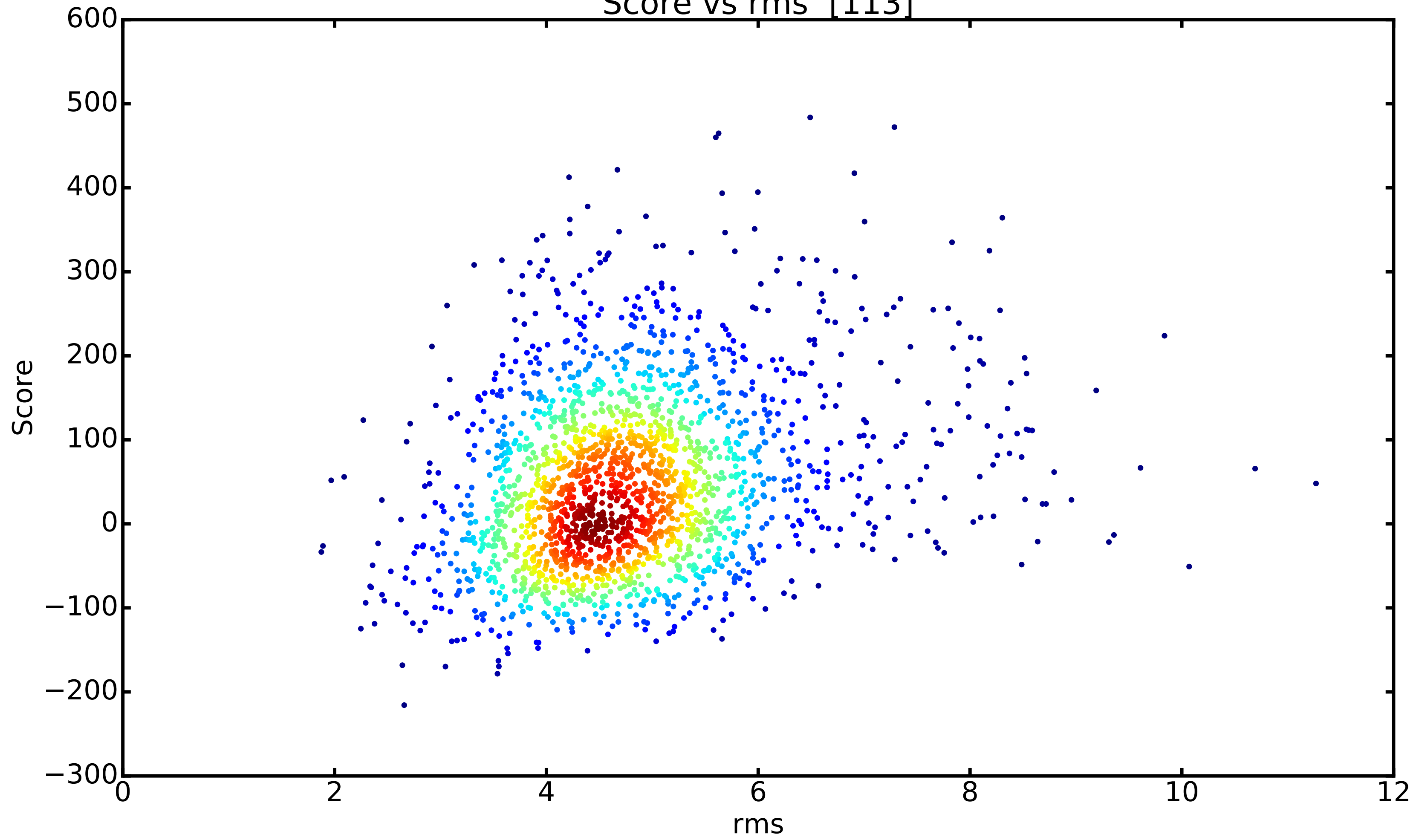




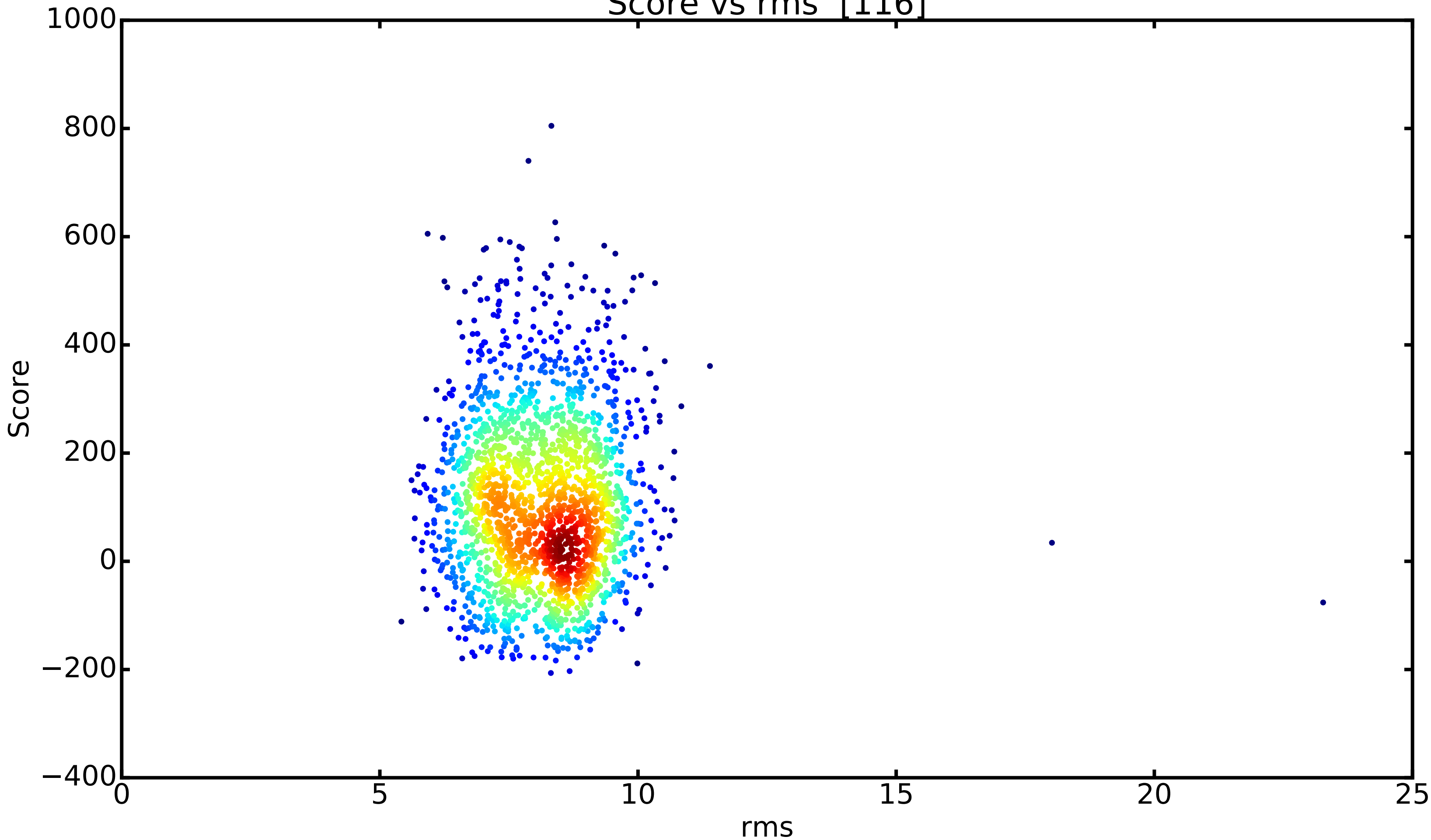
Score vs rms [106]



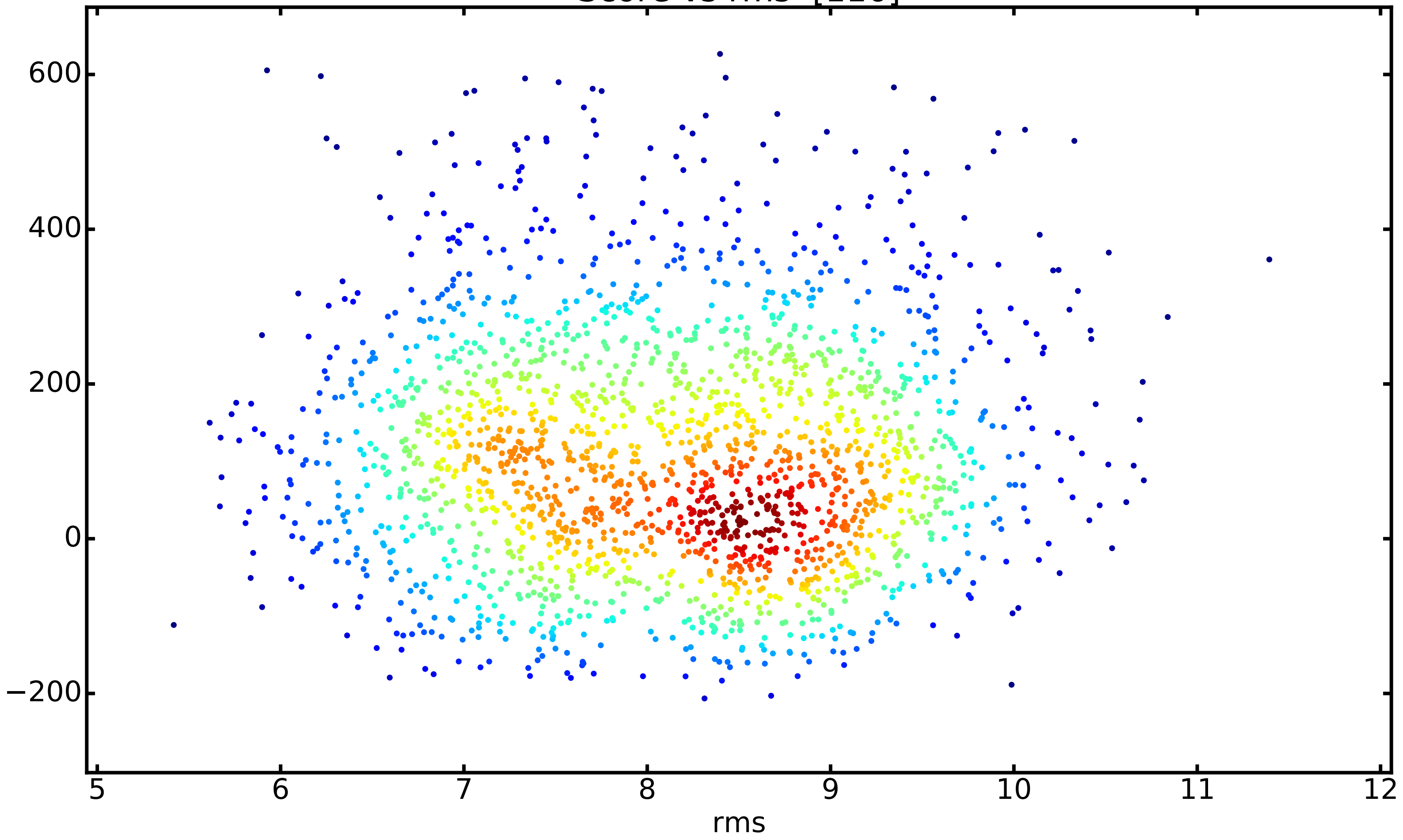
Score vs rms [113]



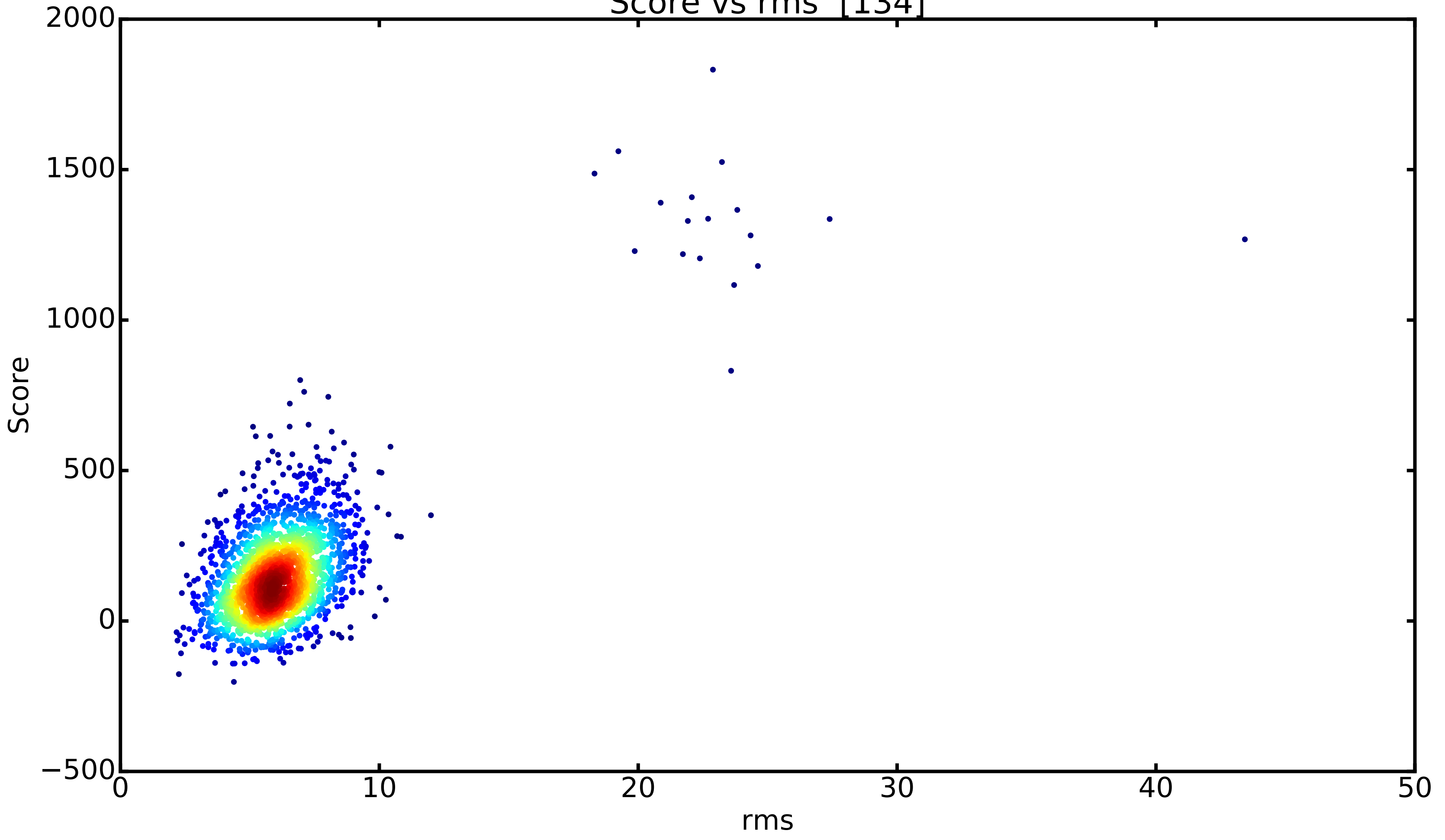
Score vs rms [116]



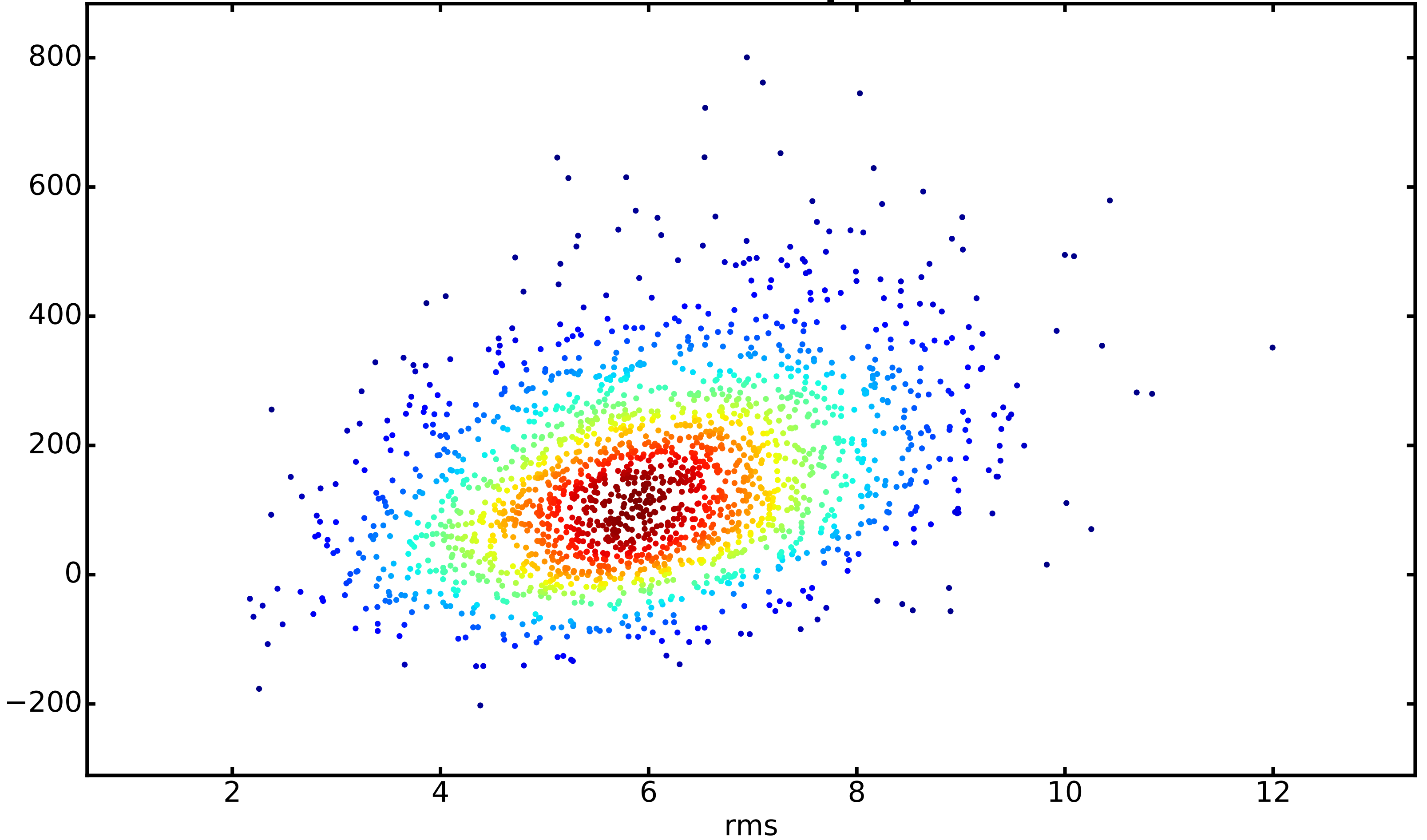
Score vs rms [116]



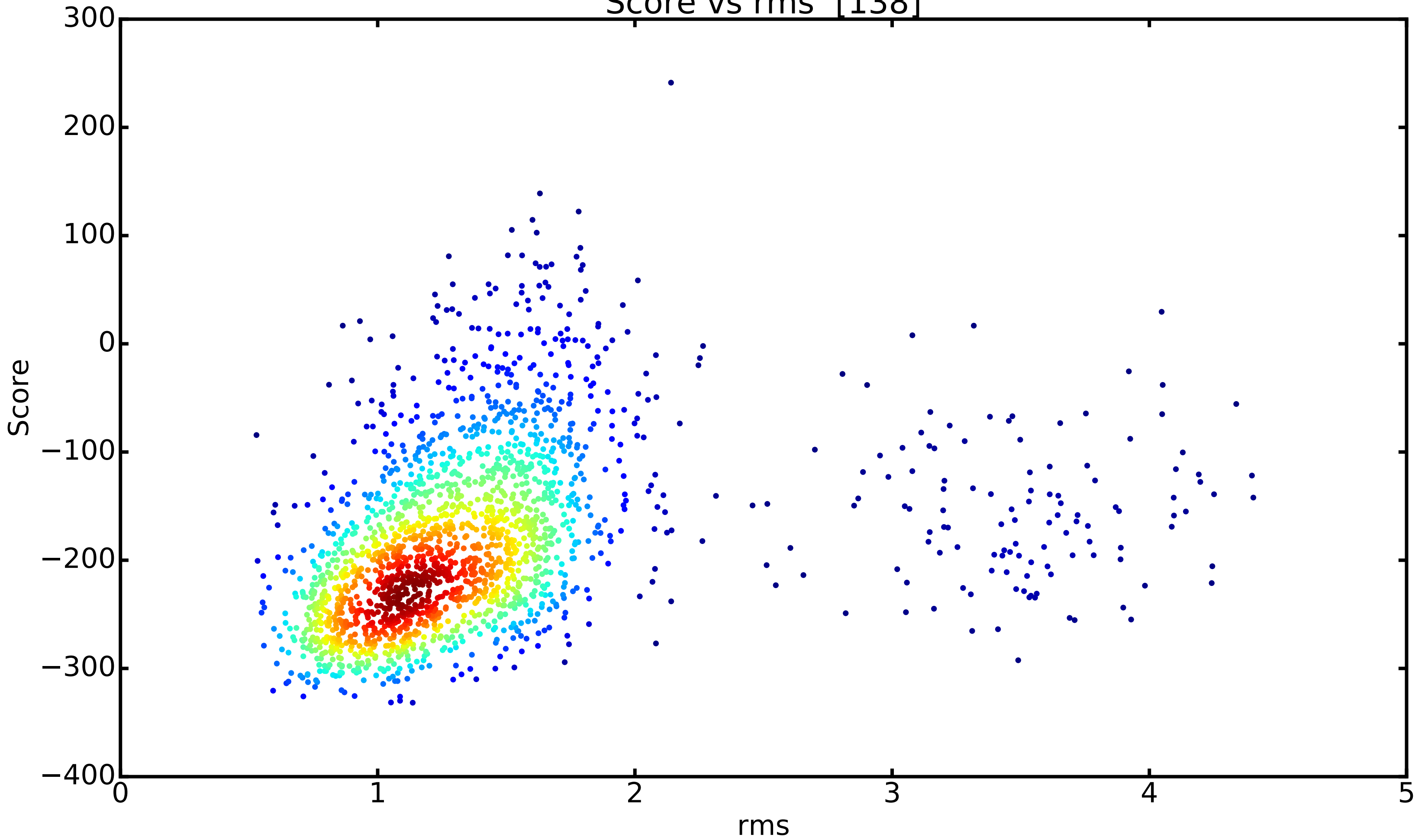
Score vs rms [134]



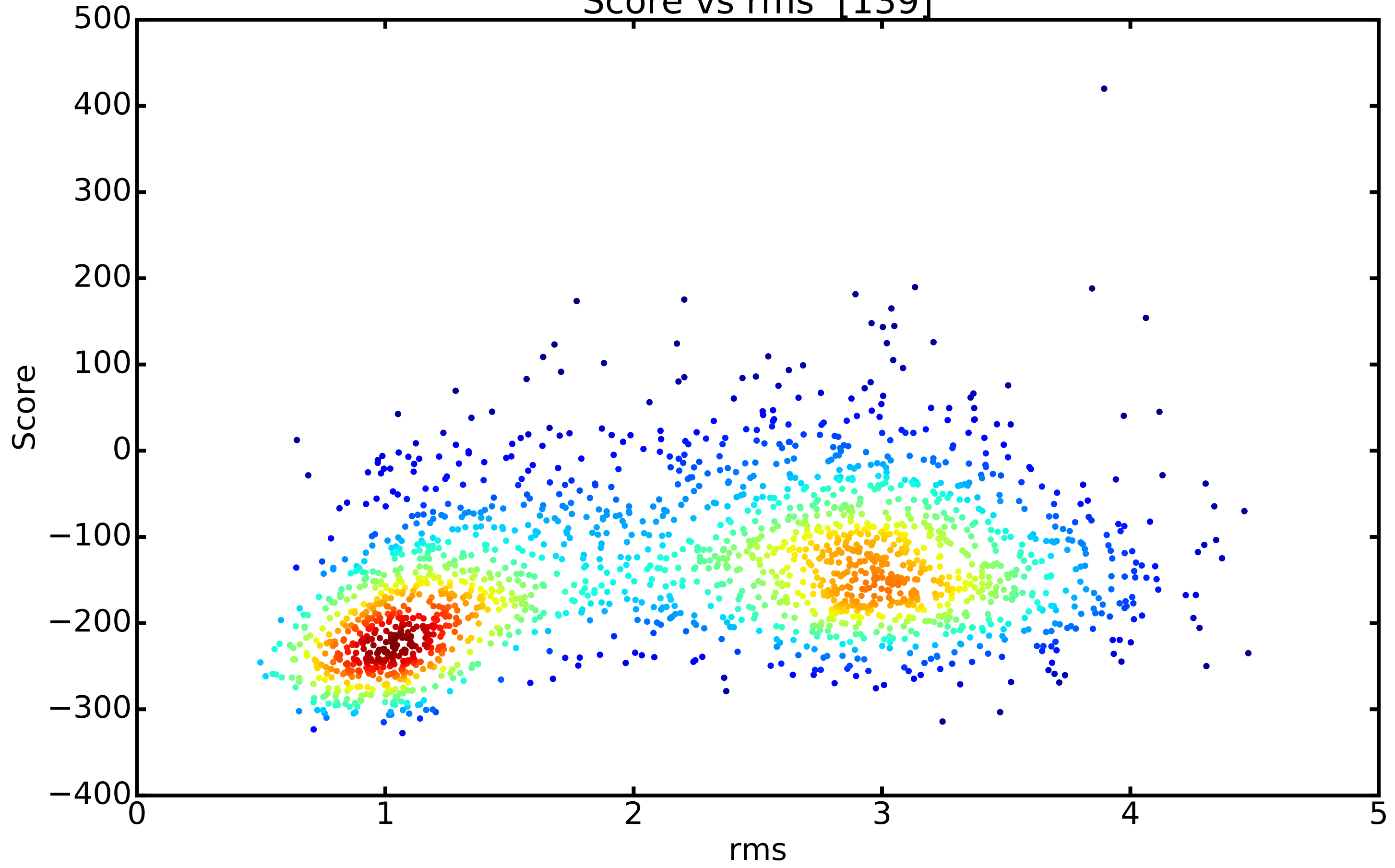
Score vs rms [134]



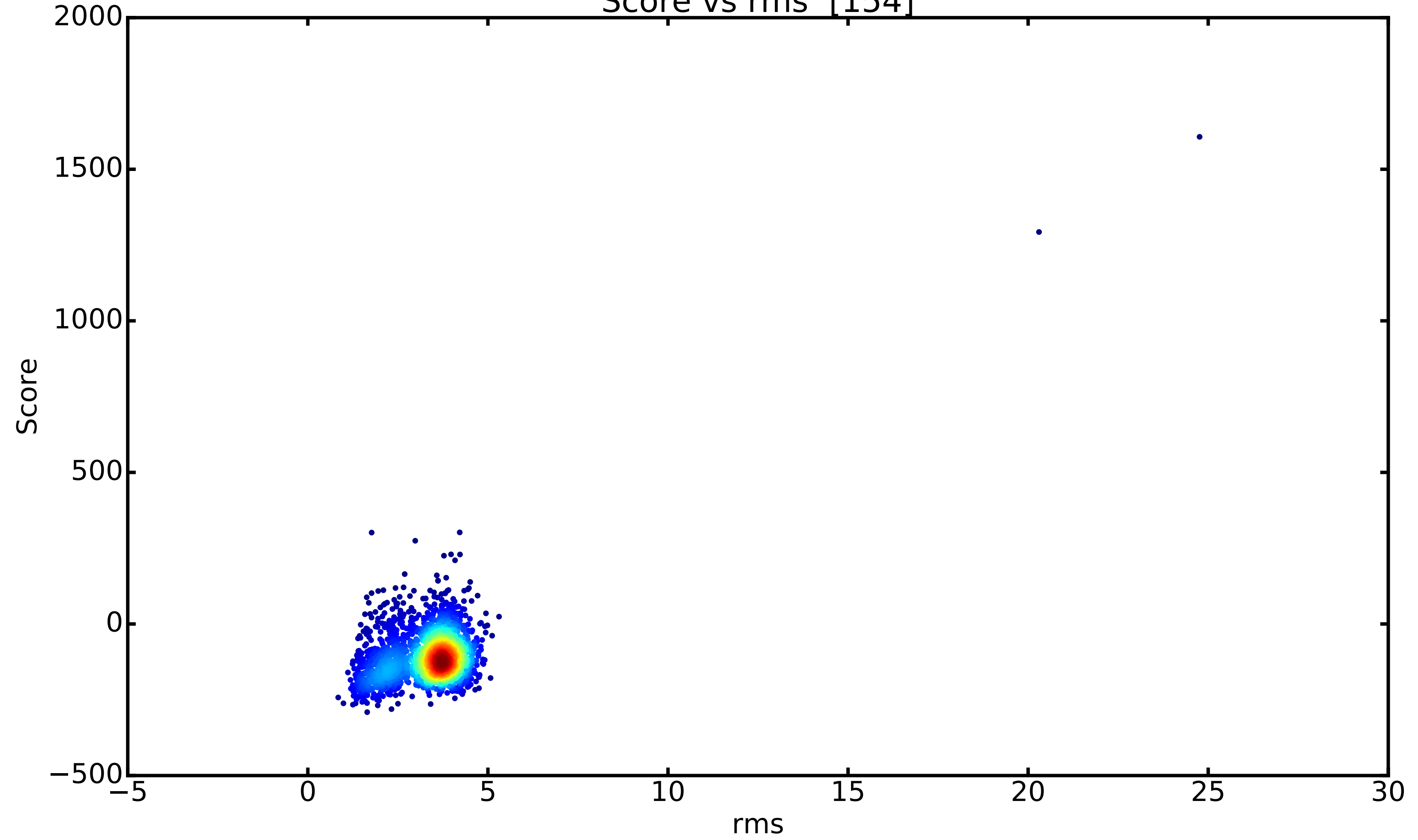
Score vs rms [138]



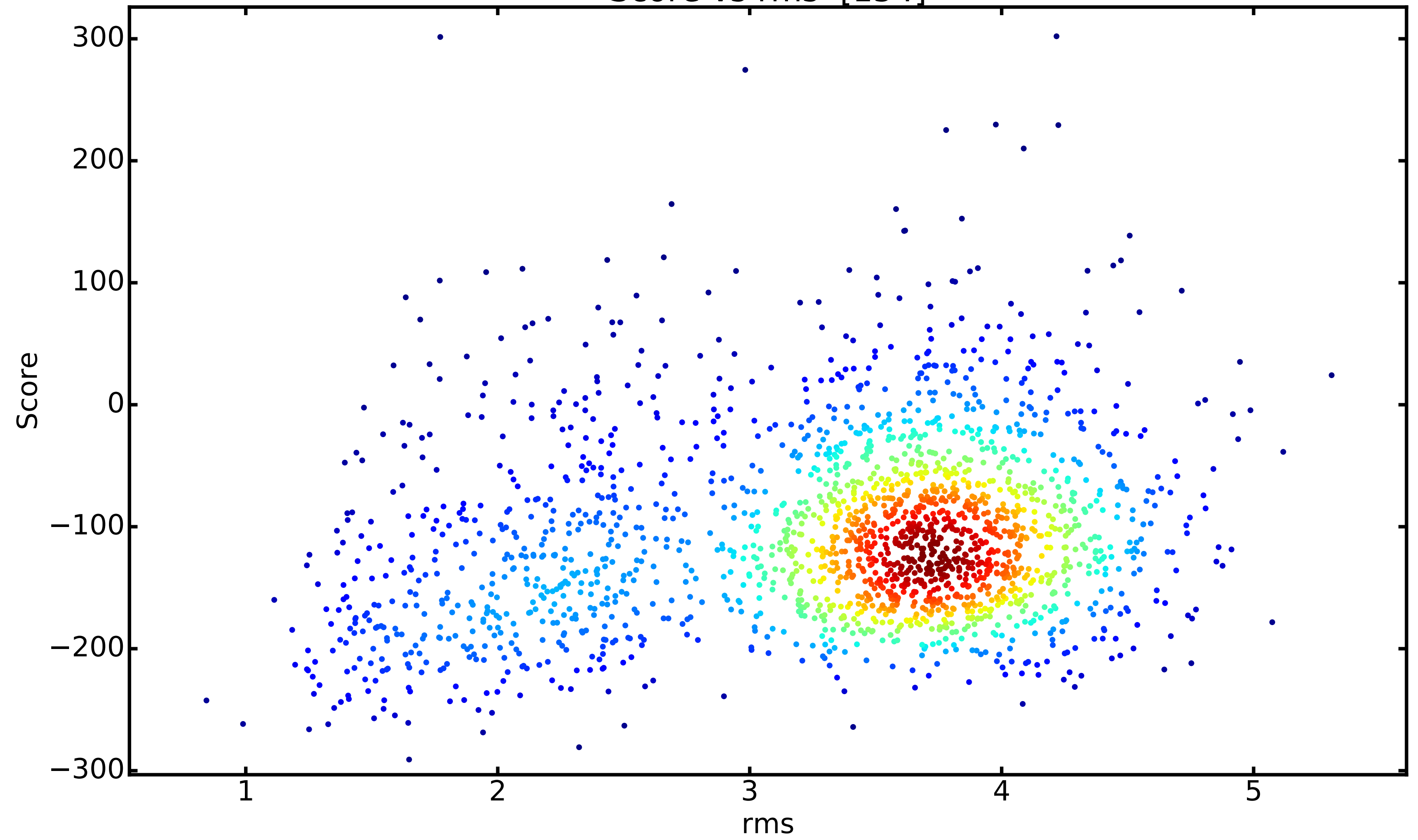
Score vs rms [139]



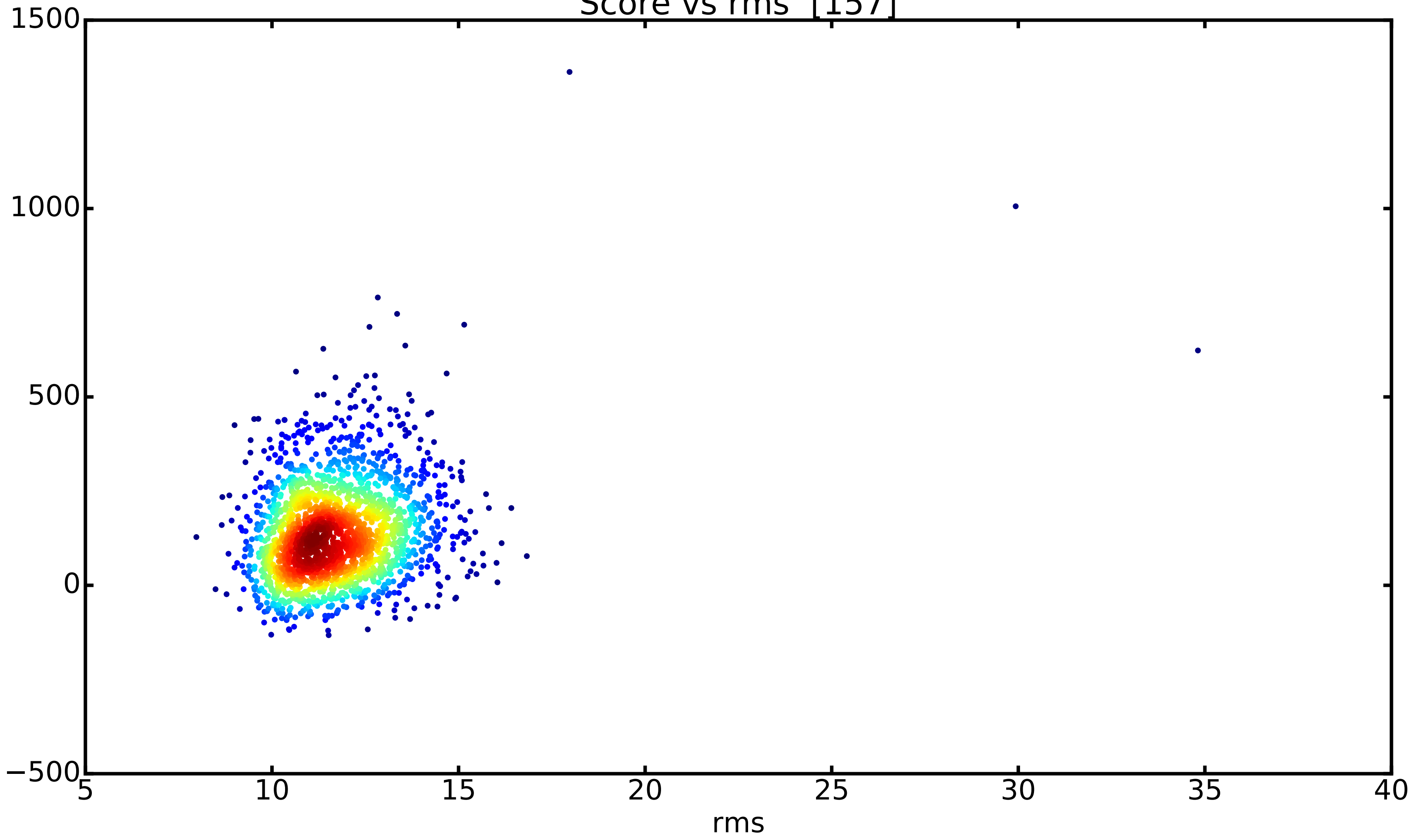
Score vs rms [154]



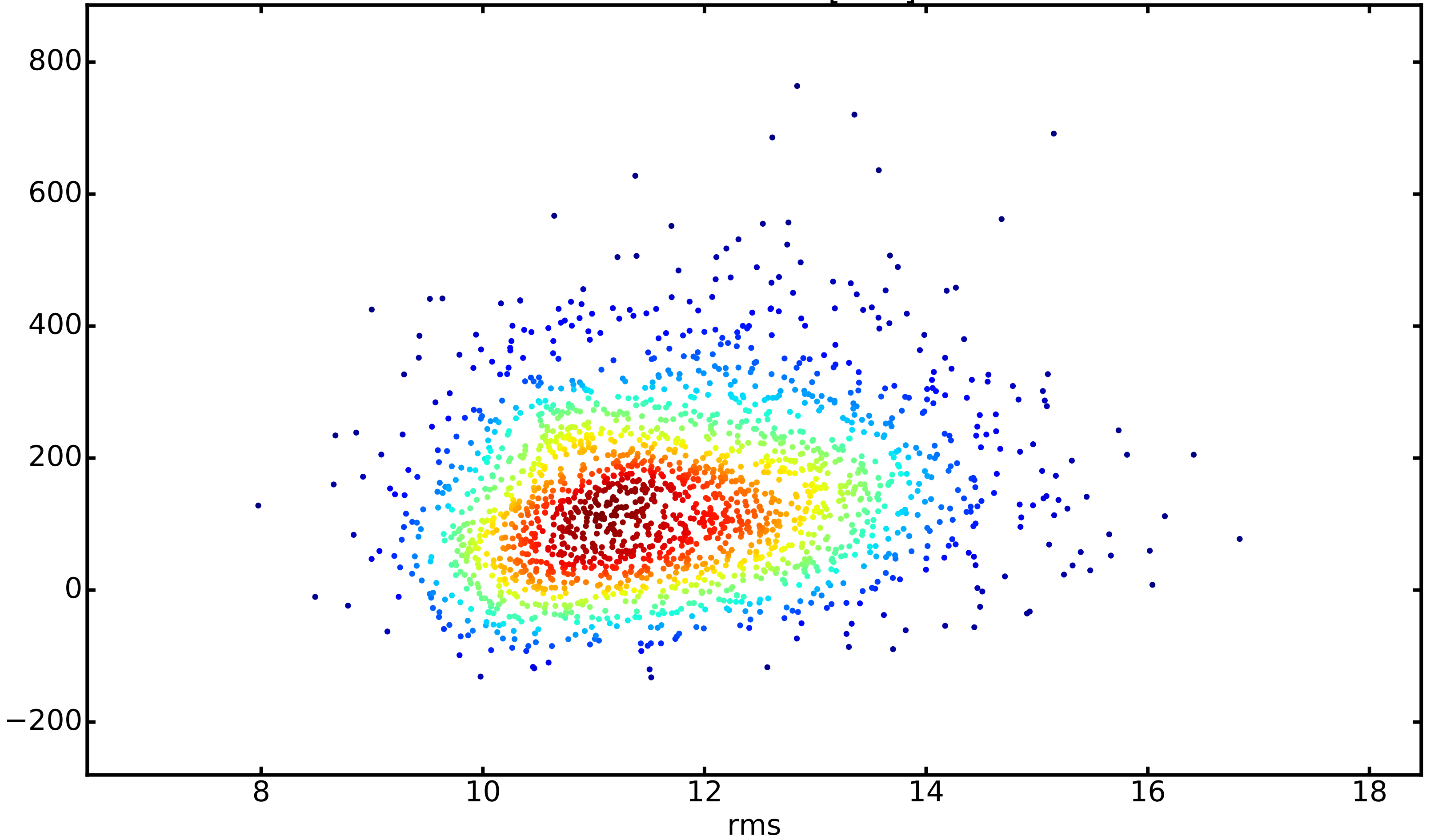
Score vs rms [154]



Score vs rms [157]



Score vs rms [157]



Score vs rms [160]

