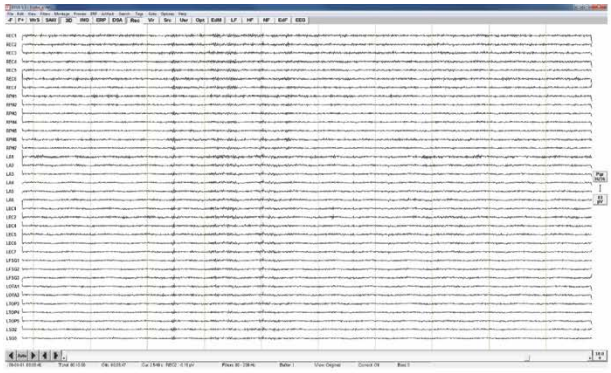
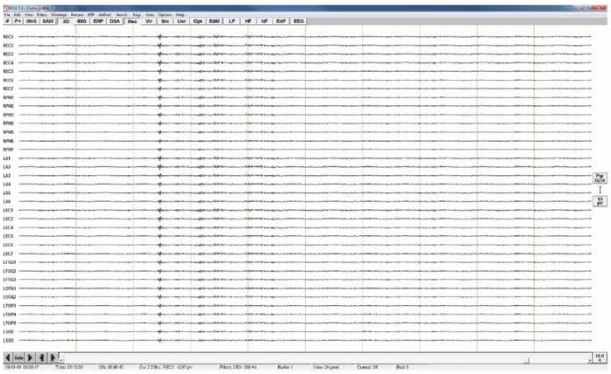
Supplementary Data

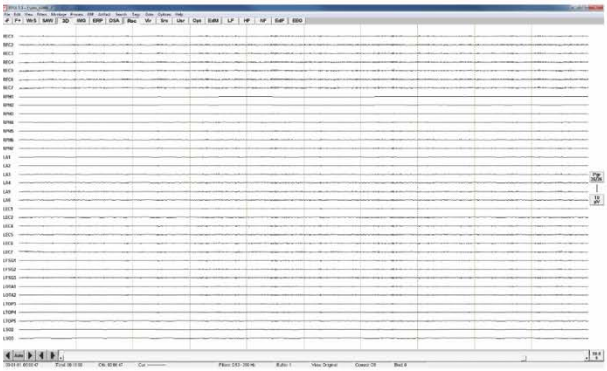
Utilization of independent component analysis for accurate pathological ripple detection in intracranial EEG recordings recorded extra- and intra-operatively.



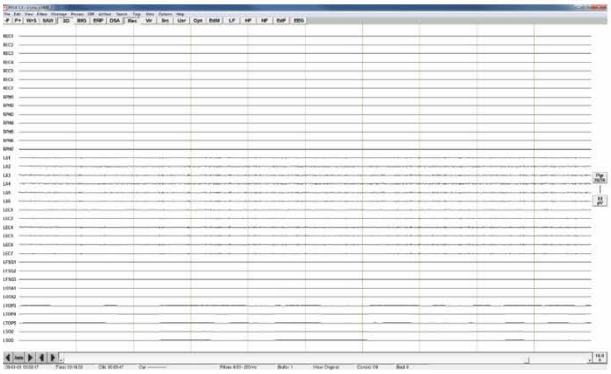
iEEG
Band-Pass Filter
(80-600 Hz)



iEEG
Band-Pass Filter
(80-600 Hz)
IC1

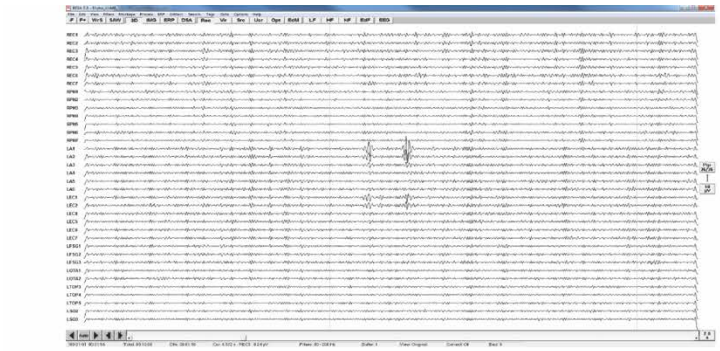


iEEG
Band-Pass Filter
(80-600 Hz)
IC2

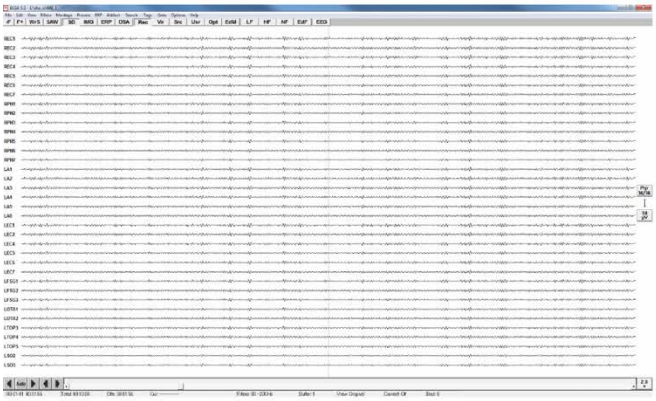


iEEG
Band-Pass Filter
(80-600 Hz)
IC3

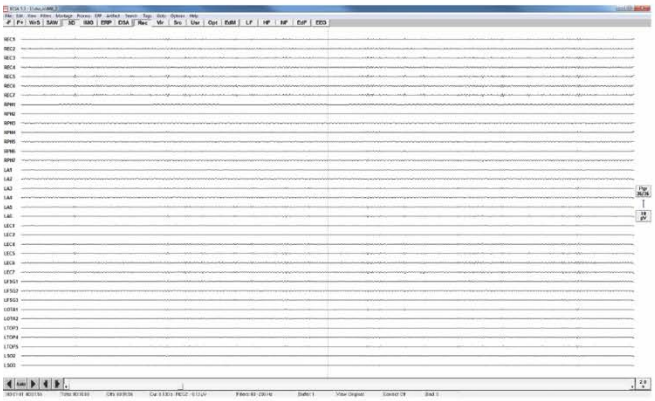
Supplementary Figure S1: Muscle artifact is mostly isolated to the first independent component of the band-pass (80-600 Hz) iEEG. Two seconds of a typical iEEG band-pass filtered recording that is contaminated by muscle artifact and does not exhibit any HFO events. The muscle artifact is largely isolated to IC1 and is less evident in IC2 and IC3.



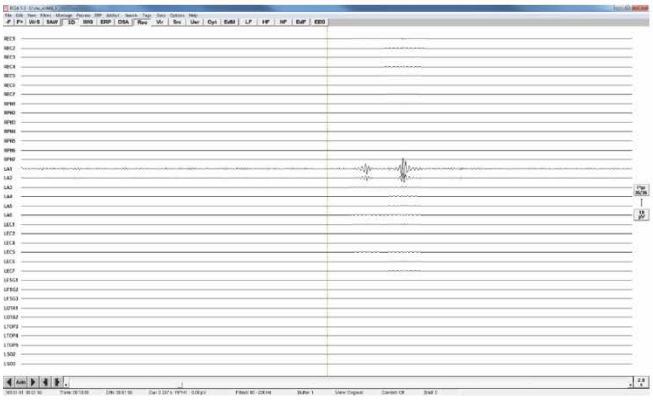
iEEG
Band-Pass Filter
(80-600 Hz)



iEEG
Band-Pass Filter
(80-600 Hz)
IC1



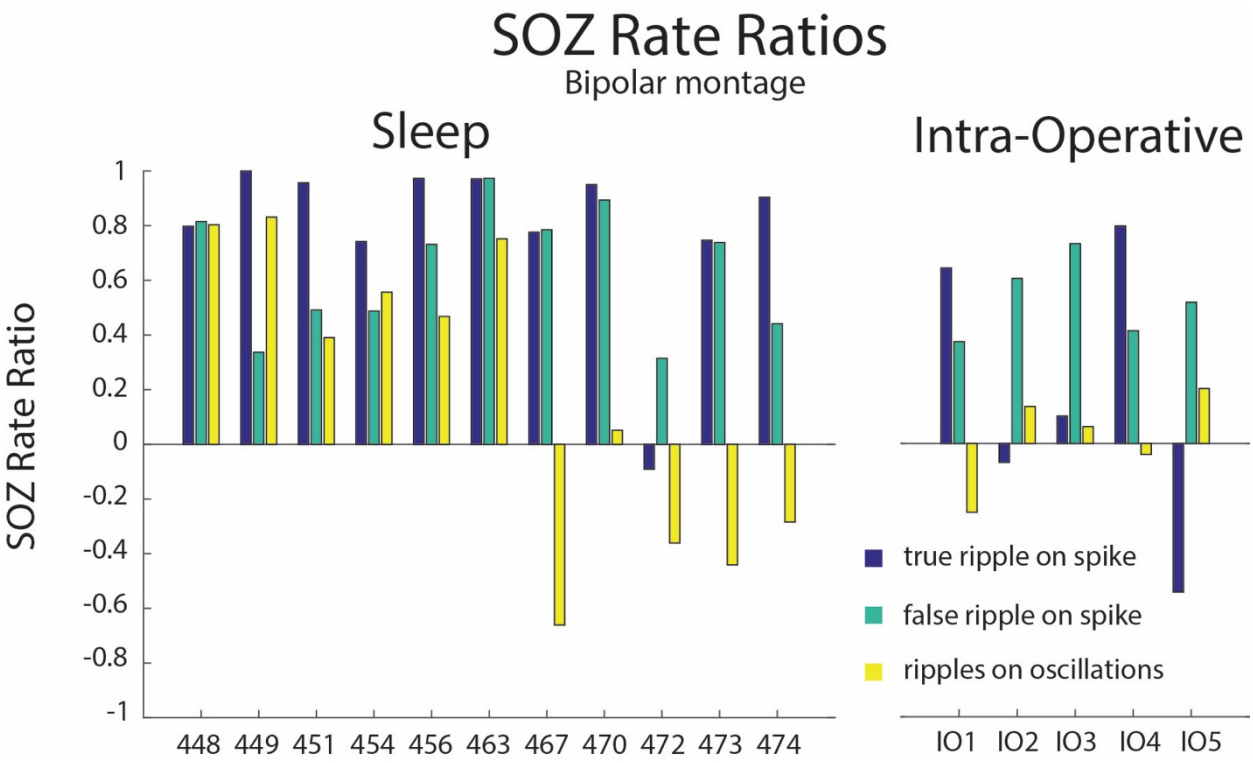
iEEG
Band-Pass Filter
(80-600 Hz)
IC2



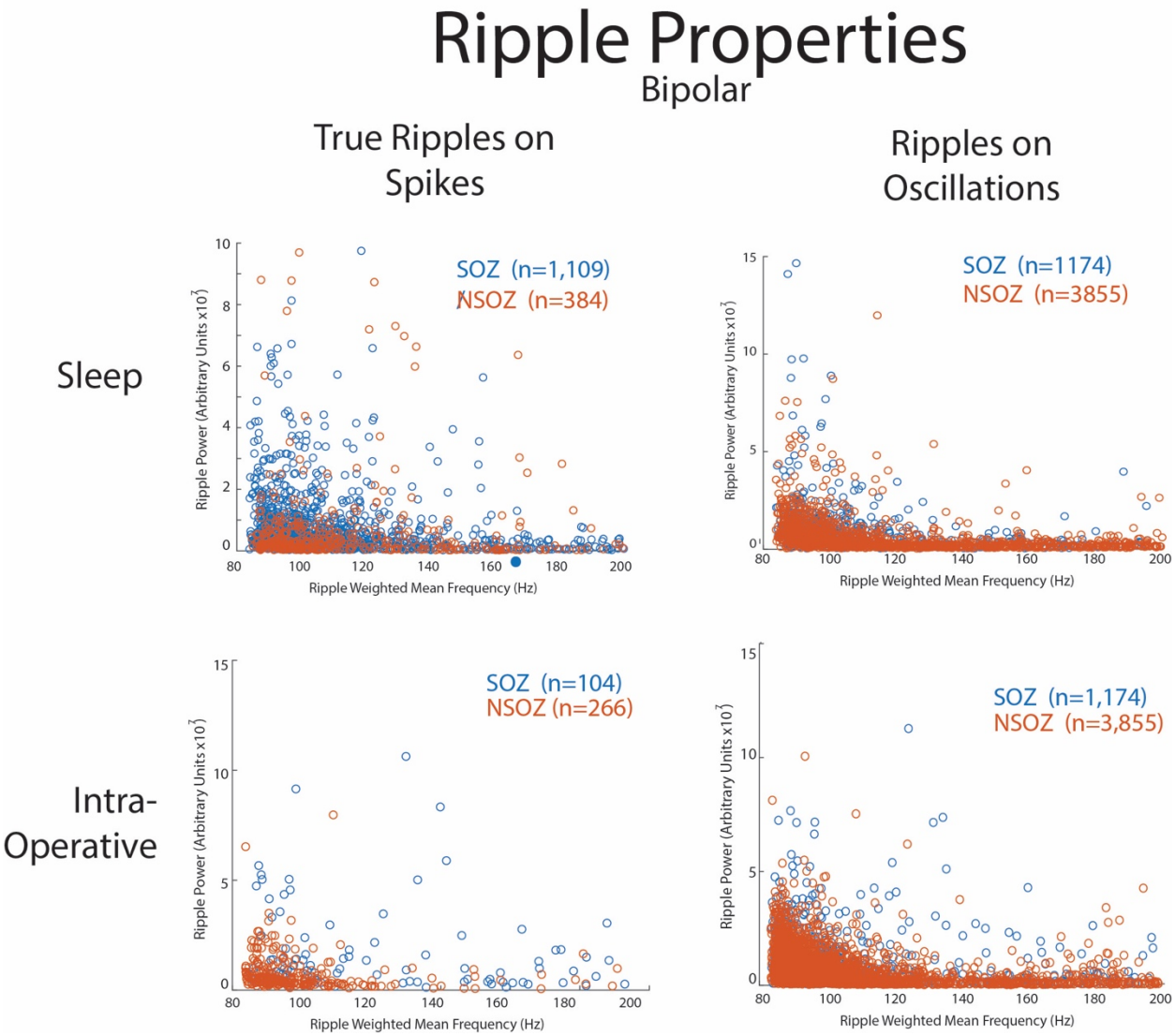
iEEG
Band-Pass Filter
(80-600 Hz)
IC5

Supplementary Figure S2: Muscle artifact is mostly isolated to the first independent component of the band-pass (80-600 Hz) iEEG, and HFO events can be isolated in individual components. Two seconds of a typical iEEG band-pass filtered recording that is contaminated by muscle

artifact, with HFO events. The muscle artifact is largely isolated to IC1 and is less evident in IC2. A subset of the HFO events are isolated in IC5.



Supplementary Figure S3: Ripple rates are also increased in the seizure onset zone using bipolar montage. The seizure onset zone rate ratio for true ripples on spikes (blue), false ripples on spikes (green), and ripples on oscillations (yellow) for each of the 16 patients when bipolar montage recordings were utilized.



Supplementary Figure S4: Differences in the spectral content and power of ripples inside and outside the seizure onset zone identified in bipolar montage recordings. Weighted mean frequency and power of true ripples on spikes (left) and ripples on oscillations (right) inside (blue) and outside (red) of the seizure onset zone derived from bipolar montage recordings during sleep (top), and in the operating room (right).