



Fig. S1. Example CO₂ response curves of plants measured on flag leaves in the field during the mid-grain filling stage in 2013. Circles and diamonds indicate measurements of Koshihikari and Takanari, respectively. Open and closed symbols indicate plants grown in ambient and FACE conditions, respectively. (a) $A-C_i$ curves fitted using to data points directly measured in the field by a commercial infra-red gas analyzer, using the “conventional method” described by Long and Bernacchi (2003). (b) $A-C_c$ curves calculated from the $A-C_i$ curves in (a) incorporating estimates of mesophyll conductance by employing a curve-fitting utility that simultaneously solves for mesophyll conductance alongside $V_{c,max}$ and J_{max} (Sharkey et al. 2007).