



Figure 4: Correlation of carbon-13 isotope ($\delta^{13}\text{C}$) records spanning the base Toarcian Stage defined in the GSSP in the Penniche section in Portugal (Fig. 2, Bordalo da Rocha et al., 2016; Hesselbo et al., 2020). The GSSP occurs in the lower part of the distinct $\delta^{13}\text{C}$ valley evident in boreholes JJ and X (De Keyser et al., in review), Mochras borehole (Storm et al., 2020 and references therein); and Chacay Melehue (Al-Suwaidi et al., 2022). Uppermost Pliensbachian global sequence boundary SB JPI8 is positioned at the base of the lower $\delta^{13}\text{C}$ plateau in the Mochras borehole (Ruebsam and Al-Husseini, 2021), and is correlated to an unconformity below massive anhydrites in borehole JJ in Kuwait (De Keyser et al., in review). Biostratigraphic interpretations in Kuwait indicate the Pliensbachian-Toarcian transition spans the boundary between the Lower and Middle Marrat members (LM/MM) in borehole JJ (Crespo de Cabrera et al., 2023).