



FIG. 4: Effective mass plots for the boost-projected proton correlation functions. For each value of the electric field strength, the curved upper band shows the result of the simultaneous fit to both boost-projected correlation functions using Eq. (27). The band accounts for the uncertainty in the extracted ground state rest energy,  $E(\mathcal{E})$ . The curved lower band shows the contribution to the fit from only the ground state, while the flat band shows just the extracted value of  $E(\mathcal{E})$  with its uncertainty.

and anomalous magnetic coupling for the excited state. Note that we force the proton charge to have the value  $Q = 1$ . Because we have an improved current, we expect only  $\mathcal{O}(a^2)$  differences from the continuum value. In Fig. 4, we show the effective mass plots for the boost projected proton correlation functions. Along with these plots, we show the effective masses resulting from the simultaneous fit to both boost projected correlators using Eq. (27). Details of the fits to proton correlation functions, and the extracted parameters from the fits are collected in Table II.