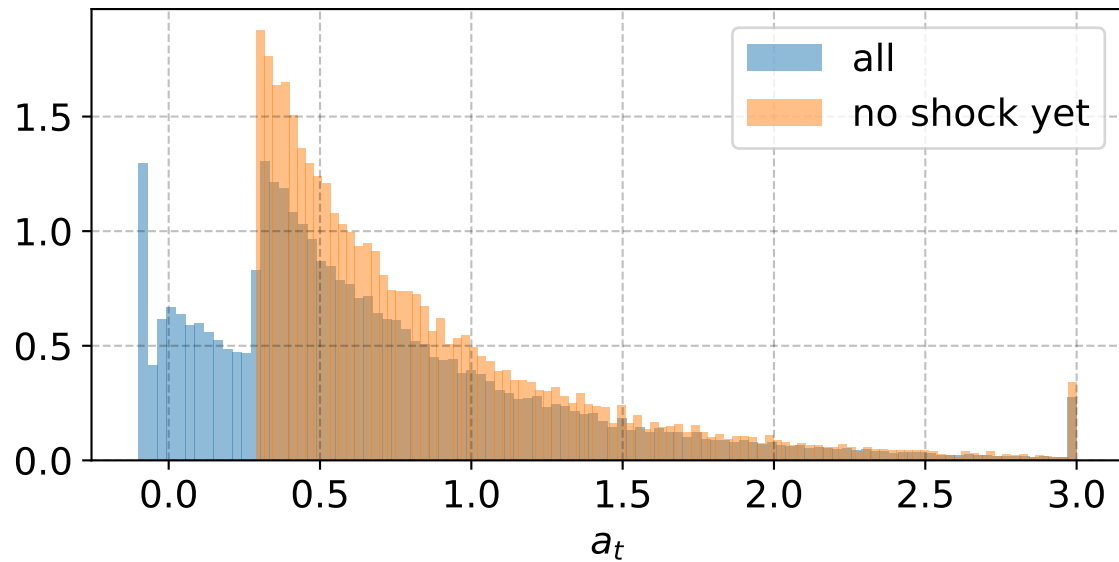histograms of a_t