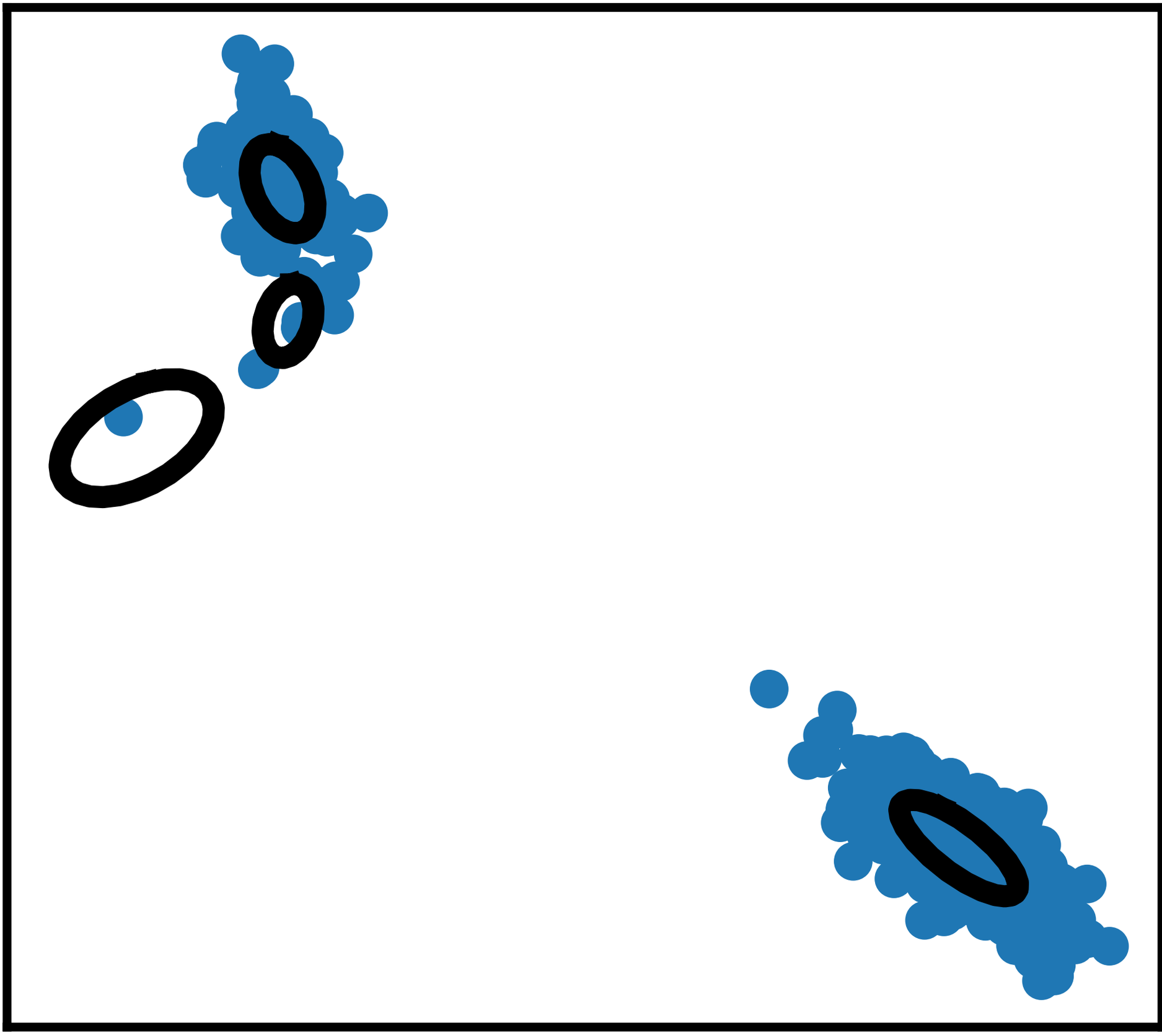alpha= 1.0 , N= 500