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A Machine Learning (Bayesian Optimization) Based Solution to the Nonlinear Response Analysis in Dusty Plasma .[1] ZHIYUE DING, TRUELL HYDE, CASPER, Baylor University — A machine learning based method for solving nonlinear response analysis for a single dust particle inside the plasma sheath of a complex plasma is presented. By matching the simulated response curves (both primary response and secondary response) to the corresponding experimentally measured counterparts in a Bayesian manner, the parameters characterizing the plasma environment can be derived efficiently. It will be shown that a correction to the parameters of higher order nonlinearities derived from perturbation method is indicated by this numerical method..

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