Abstract Submitted
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Full Wave Simulations of Shear Alfven Wave propagation in the LAPD using Petra-M[1] KUNAL SANWALKA, JEFFREY ROBERTSON, STEPHEN VINCENA, University of California, Los Angeles, SYUN'ICHI SHIRAIWA, NICOLA BERTELLI, Princeton Plasma Physics Laboratory, JOHN WRIGHT, Plasma Science and Fusion Center, MIT, TROY CARTER, University of California, Los Angeles — Shear Alfven waves (SAWs) are simulated in the Large Plasma Device (LAPD) using the full wave, finite element method solver Petra-M [1]. Petra-M allows us to study wave propagation using realistic experimental conditions including CAD-based antenna and vacuum vessel geometry, along with experimentally relevant density and magnetic field profiles under the cold two-fluid plasma approximation. Petra-M simulations have been verified against analytic models and other simulation approaches, showing good agreement. Validation of Petra-M results have been carried out through comparisons with experimental measurements of Alfven wave characteristics in LAPD. Petra-M is being applied to understand the propagation of SAWs into axial gradients of the Alfven speed [2], and generation and propagation of SAWs in multi-ion species plasmas [3]. 1.Shiraiwa, S. et. al. RF wave simulation for cold edge plasmas using the MFEM library, EPJ Web Conf. 157, 03048 (2017) 2.Bose, S. et al. Measured Reduction in Alfven Wave Energy Propagating through Longitudinal Gradients Scaled to Match Solar Coronal Holes, The Astrophysical Journal 882, 183 (2019) 3.J. Robertson et. al. Propagation of shear Alfven waves in a two-ion plasma and application as a diagnostic for the ion density ratio, accepted in JPP

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