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Modeling of Optimization and Control of EBW Heating and Current Drive[1] JAKUB URBAN, EURATOM/IPP.CR Association, IPP AS CR, Prague, JOAN DECKER, YVES PEYSSON, EURATOM-CEA, Cadarache, France, JOSEF PREINHAELTER, EURATOM/IPP.CR Association, IPP AS CR, Prague, GARY TAYLOR, Princeton Plasma Physics Laboratory, Princeton, NJ, USA, LINDA VAHALA, Old Dominion University, Norfolk, VA, USA, GEORGE VAHALA, College of William & Mary, Williamsburg, VA, USA — We present a modeling of Electron Bernstein waves (EBWs) by recently coupled AMR (Antenna—Mode-conversion—Ray-tracing) and LUKE (3D Fokker-Planck) codes. The electrostatic EBW is a promising candidate for localized heating and current drive in high-β plasmas, where the standard electron cyclotron O- and X-waves are cutoff. EBW heating and current drive is simulated here in spherical tokamak conditions, particularly in typical NSTX and MAST equilibria and also in equilibria predicted by transport modeling. The EBW injection parameters are varied in order to find optimized scenarios and a possible way to control the deposition location and the driven current. This task is rather challenging because EBW ray trajectories and $N_{\|}$ spectra are strongly dependent on the plasma parameters.

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