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Amplitude and phase for ray splitting in linear wave conversion[1]
ANDRE JAUN, NADA Royal Inst Technology Stockholm, EUGENE R. TRACY, STEVE RICHARDSON, College of William and Mary, ALLAN N. KAUFMAN, LBNL and UCBerkeley — Previously we have reported on the ray trajectories which arise in linear resonant plasma-wave conversion (mode conversion) in tokamak geometry, and have described the implementation of an algorithm to treat the associated ray splitting that occurs with conversion [1]. We have shown how an incident ray gives rise to transmitted, converted, and reflected rays, noting the important effect of the poloidal magnetic field in the conversion of a magnetosonic wave to ion-hybrid waves [2]. We now report on the implementation of our algorithms for determining the amplitude and phase of each of these rays. Far from conversion regions, eikonal methods are used to transport amplitude, phase, and polarization on each ray. These solutions fit smoothly onto local approximations of the wave field as rays enter, split, and emerge from a conversion region in ray phase space. Our aims are to expeditiously obtain energy-deposition profiles, as well as current-drive and flow-drive profiles, and to replicate the results of a full-wave treatment, using the much simpler set of ODEs associated with ray-tracing methodology. In this poster we describe the present status of our code development. [1] E R Tracy, A N Kaufman, A Jaun, Phys LettA 290 (2001) 309. [2] A N Kaufman, E R Tracy, A Jaun, A J Brizard, BAPS /DDP04 Poster PP1.085.

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