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Similarities and differences between Beta Alfvén Eigenmodes and Geodesic Acoustic Modes CHRISTINE NGUYEN, CEA Cadarache/IRFM, France, XAVIER GARBET, ANDREI SMOLYAKOV, JOAN DECKER, GUIDO HUYSMANS, PATRICK MAGET — In this work, we make use of a gyrokinetic formalism to investigate and compare two particular modes induced by geodesic curvature, which have been experimentally observed to be excited by supra-thermal particles, the Beta Alfvén Eigenmode (BAE) and the Geodesic Acoustic Mode (GAM). First, the earlier predicted degeneracy of BAEs and GAMs is analyzed with a particular attention given to the electron response, which is likely to be adiabatic for BAEs and hydrodynamic for GAMs. It is observed that those different electron responses imply different electromagnetic effects. However, when the GAM is taken in the electrostatic limit, the dispersion relation of those modes is found degenerate due to the ideal magneto-hydrodynamic property of BAEs: $E_{\parallel} = 0$. Next, we investigate the excitation of those modes. Landau damping, expected to be the main damping process of the two modes, is computed both in the linear and nonlinear regimes and compared to the fast particle excitation processes, which are different for BAEs and for GAMs. Nguyen *C. et al*, Phys. Plasmas **15**, 112502, 2008.

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