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Investigation of energetic particle induced geodesic acoustic mode[1] MIRJAM SCHNELLER, Princeton Plasma Physics Laboratory, GUOYONG FU, Zhejiang University, ILIJA CHAVDAROVSKI, Max Planck Institute for Plasma Physics, WEIXING WANG, Princeton Plasma Physics Laboratory, PHILIPP LAUBER, ZHIXIN LU, Max Planck Institute for Plasma Physics — Energetic particles are ubiquitous in present and future tokamaks due to heating systems and fusion reactions. Anisotropy in the distribution function of the energetic particle population is able to excite oscillations from the continuous spectrum of geodesic acoustic modes (GAMs), which cannot be driven by plasma pressure gradients due to their toroidally and nearly poloidally symmetric structures. These oscillations are known as energetic particle-induced geodesic acoustic modes (EGAMs) [G.Y.Fu08] and have been observed in recent experiments [R.Nazikian08]. EGAMs are particularly attractive in the framework of turbulence regulation, since they lead to an oscillatory radial electric shear which can potentially saturate the turbulence. For the presented work, the nonlinear gyrokinetic, electrostatic, particle-in-cell code GTS [W.X.Wang06] has been extended to include an energetic particle population following either bump-on-tail Maxwellian or slowing-down [Stix76] distribution function. With this new tool, we study growth rate, frequency and mode structure of the EGAM in an ASDEX Upgrade-like scenario. A detailed understanding of EGAM excitation reveals essential for future studies of EGAM interaction with micro-turbulence.

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Mirjam Schneller
Princeton Plasma Physics Laboratory

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