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Session FP1 - Poster Session III.

*POSTER session, Tuesday morning, October 28
Fran Hill Southeast Exhibit Hall, ACC*

[FP1.121] Complete Spectrum of Kinetic Eigenmodes for Plasma Oscillations in a Weakly Collisional Plasma

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Kinetic eigenmodes of plasma oscillations in a weakly collisional plasma, described by a collision operator of the Fokker-Planck-type, are obtained in closed form for initial-value as well as boundary-value problems. These eigenmodes, which are smooth and comprise a complete discrete spectrum, play the same role for weakly collisional plasmas as the Case-Van Kampen modes do for collisionless plasmas. It is shown analytically in the limit of zero collision that the eigenfrequency of an eigenmode belonging to a subset of the spectrum tends to the value given by the usual Landau damping analysis. Fundamental implications of these results for classical as well as recent experimental and theoretical findings on the collisional decay of plasma echoes and the ballistic response are discussed.

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