Analytical, kinetic approach to the saturation of BSRS in 1D geometry

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It has been shown numerically [1] that sidebands arising from electrostatic instabilities could cause Stimulated Raman Scattering (SRS) to saturate. The main goal of this Ph.D. will be to provide an analytic understanding of this phenomenon.

We first propose to solve a simpler, related problem: the linearised evolution of a two-wave system; with a main plasma wave and a small, slowly-growing BGK perturbation. To that end, we first solve the linearised Vlasov equation in action-angle coördinates, using a Fourier series decomposition of the smaller wave, to obtain an expression for the electronic density. Then we inject this density in Poisson's equation.

References

[1] A. Friou, Thèse de doctorat, *Propagation d'un impulsion laser intense dans un plasma sous-dense : creusement de canal et diffusion Raman stuimulée*