Thermal effects in a triplet and beam interaction in a plasma

S. Marini[1], E. Peter[2], R. Pakter[2], F.B. Rizzato[2]

[1] *LULI, Sorbonne Universitè, CNRS, Ècole Polytechnique, CEA, 75005, Paris, France*

[2] *Instituto de Física – Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil*

A lot of interesting results come from the triplet concept, where three waves with wavenumber and frequency match conditions interact with themselves, exchanging energy. For example, if the coupling factor is small in a way the frequency of the envelope of each wave is slower than the slowest frequency of the carriers, the dynamics is regular [1-3].
However, the dynamics of the triplet may be dramatically affected if a charged particle beam is introduced in the system. This case was previously studied for a cold beam [4]. The present work extends the results to a warm beam, considering a *water bag* initial distribution for the velocities. The focus is on the beginning of the system dynamics. Some features of the beam as the center of the distribution as well as the distribution width are of interest and their role is discussed.

References

[1] S. G. Thornhill, and D.ter Haar, Phys. Reports, **43**, 43 (1978)

[2] P. M. Drysdale, and P. A. Robinson, Phys. Plasmas, **9**, 4896 (2002)

[3] P. Iorra, S. Marini, E. Peter, R. Pakter, and F. B. Rizzato, Physica A, **436**, 686 (2015)

[4] E. Peter, S. Marini, R. Pakter, and F. B. Rizzato, Phy. Plasmas **24**, 102124 (2017)