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David H Sattinger* (dhs@math.usu.edu), Department of Mathematics and Statistics, Utah State University, Logan, UT 84322, and **Mariana Haragus** and **David P Nicholls**. *Solitary wave interactions of the Euler-Poisson equations*. Preliminary report.

Analytical and experimental studies of the interaction of solitary waves of various speeds of the ion acoustic plasma equations are carried out. It is found that the non-elastic effects of the interaction are small, even for high amplitudes. The major discrepancy in the KdV approximation from the solutions of the Euler-Poisson equations comes in the displacement of the emerging solitary waves from those of the 2-soliton solution of the KdV equation. An analytical formula for the second order correction to the KdV approximation is obtained. It has secular terms, corresponding to the fact that the linearized KdV equation at the 2-soliton solution has a 4 dimensional kernel. (Received September 11, 2000)