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**Attraction of positively charged dust grains in a plasma** GIAN LUCA DELZANNO, GIOVANNI LAPENTA, LANL — In two recent papers, Delzanno et al. [1-2] have pointed out that an electron emitting dust grain immersed in a plasma can sustain profiles of the shielding potential having an attractive potential well. The existence of attractive potential wells around dust grains in a plasma is of considerable interest as it provides an alternative mechanism for the attraction of the grains. Moreover, this mechanism can play an important role in astrophysical scenarios, for example in star forming regions where a substantial UV field is responsible for grain photoemission. We have therefore developed a three-dimensional PIC code with the aim of studying the collapse of a system of grains undergoing gravitational and electrostatic forces (the latter modeled via the potential well discovered in Refs. [1,2]). We will show how the attractive potential well can indeed lead to the collapse of the system, at rates which can be higher with respect to the pure gravitational analogue. Further on, a pure monotonic Debye-Huckel electrostatic potential can impede the collapse, depending on the charge to mass ratio of the grains. These results are in agreement with the predictions of the linear theory we have recently developed [3]. [1] G. L. Delzanno, G. Lapenta, M. Rosenberg, Phys. Rev. Lett. 92 (3), 035002 (2004). [2] G. L. Delzanno, A. Bruno, G. Sorasio, G. Lapenta, Phys. Plasmas 12, 062102 (2005). [3] G. L. Delzanno, G. Lapenta, Phys. Rev. Lett. 94, 175005 (2005).

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