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Study of the heating and expansion of spherical nanoplasmas GIANNI COPPA, ROBERTA MULAS, Politecnico di Torino, Italy, ELISABETTA BOELLA, GIAN LUCA DELZANNO, Los Alamos National Laboratory — The present work deals with the analysis of the interaction between a laser pulse and a gas cluster. The phenomenon is characterized by three different phases: 1) electron ionization and heating by the laser radiation; 2) escape of the most energetic electrons; 3) ion acceleration due to the positive charge inside the sphere. Although these three phases have different timescales, for a rigorous analysis they cannot be studied as completely separated. In the poster, results obtained by means of a numerical code developed by the Authors are presented. In the code a three-dimensional particle technique for electrons and positive ions is employed, in which the electric field is calculated considering a perfect spherical symmetry by resorting to the Gauss' law. The method has two advantages: 1) it preserves the symmetry of the problem; 2) a grid is not necessary and, consequently, the calculation of the electric field requires little computational effort. In the code, a simplified model for the electron heating is introduced by considering collisions between electrons and fictitious energetic particles.

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