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**Wave propagation and magnetic field generation in Rydberg plasmas** HUGO TERCAS, NITIN SHUKLA, Instituto Superior Tecnico, Lisboa, Portugal, P.K. SHUKLA, Ruhr Universitat, Bochum, Germany, J. LOUREIRO, J.T. MENDONCA, Instituto Superior Tecnico, Lisboa, Portugal — We call Rydberg plasma the weakly ionized gas produced in magneto-optical traps. In such a plasma, the neutral atoms can be excited in Rydberg states. Wave propagation in Rydberg plasmas, and the mutual influence of plasma dispersion and atomic dispersion is considered. New dispersion relations are established, showing new instability regimes and new cut-off frequencies. It is also shown that the ponderomotive force of a large-amplitude electromagnetic wave in Rydberg plasmas can generate quasi-stationary magnetic fields. The present result can account for the origin of seed magnetic fields in ultracold Rydberg plasmas when they are irradiated by the high-frequency electromagnetic wave.

J. T. Mendonca  
Instituto Superior Tecnico, Lisboa, Portugal

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