

Abstract Submitted  
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**Recurrence relations and time evolution in the relativistic electron gas at long wavelengths**<sup>1</sup> ERICA SILVA<sup>2</sup>, Instituto de Física, Universidade Federal de Mato Grosso, Cuiabá, MT, Brazil — Some years ago M. Howard Lee developed the recurrence relations method to solve the Heisenberg motion equation in an exact way. The relaxation and memory functions, as other linear-response quantities, e.g., the density-density response function and the dynamic structure factor, were obtained for the two- and three-dimensional non-relativistic electronic systems at long wavelengths. In this work we study the time- and frequency-dependent behavior of the relativistic electron gas. As some applications, one can cite graphene, in two dimensions, and dwarf stars, in the three-dimensional case, since both systems have a relativistic electron gas in their compositions.

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