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Landau damping of sound waves in kinetic magnetohydrodynamics JESUS J. RAMOS, Retired — The Landau damping of slow sound waves propagating parallel to the magnetic field in a homogeneous, collisionless and quasineutral plasma is investigated using the kinetic magnetohydrodynamics formulation of J.J. Ramos, J. Plasma Phys., 905810325 (2015), 905820607 (2016). In this approach, the electric field is eliminated from a closed, hybrid fluid-kinetic system that ensures automatically the fulfillment of the quasineutrality condition. Considering the time evolution of a parallel-propagating sound wave spatial Fourier mode, this can be cast as a standard, second-order self-adjoint problem, with a continuum spectrum of real and positive squared frequencies. Therefore, a standard resolution of the identity with a single continuum basis of singular normal modes is guaranteed, which simplifies significantly a Van Kampen-like treatment of the Landau damping. The explicit form of such singular normal modes is obtained and they are used to derive the damped time evolution of the fluid moments of a wave packet of distribution functions in an initial value problem. As mentioned, the electric field is not used in the treatment of this problem, but it is calculated from its solution after it has been obtained.

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