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Fluid Modes of a Spherically Confined Yukawa Plasma[1] HANNO KAEHLERT, MICHAEL BONITZ, ITAP, Christian-Albrechts-Universitaet zu Kiel, Germany — The normal modes of a three-dimensional Yukawa plasma in an isotropic, harmonic confinement are investigated by solving the linearized cold fluid equations. The eigenmodes are found analytically in terms of hypergeometric functions. The mode frequencies solely depend on the dimensionless plasma parameter $\xi = \kappa R$, where R is the plasma radius and κ the inverse screening length. The eigenfrequencies increase monotonically with ξ and saturate in the limit $\xi \to \infty$. Compared with the results in the Coulomb limit [D. H. E. Dubin, Phys. Rev. Lett. **66**, 2076 (1991)], we find a new class of modes characterized by the number n which determines the number of radial nodes in the perturbed potential. We compare the fluid modes with molecular dynamics simulations and find good agreement for low order modes and weak to moderate screening.

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