

Abstract Submitted
for the DAMOP18 Meeting of
The American Physical Society

Density Wave Instability in Bilayer Dipolar Systems in the Antiparallel Configuration¹ B. TANATAR, E. AKATURK, Department of Physics, Bilkent University, Ankara, Bilkent, Turkey, S.H. ABEDINPOUR, Department of Physics, Institute for Advanced Studies in Basic Sciences, Zanjan, Iran — We consider a bilayer of dipolar particles in which the polarization of dipoles is perpendicular to the planes, in the antiparallel configuration. Using accurate static structure factor $S(q)$ data from hypernetted-chain and Fermi hypernetted-chain calculations, respectively for an isolated layer of dipolar bosons and dipolar fermions, we construct effective screened intralayer interactions. Adopting the random-phase approximation for interlayer interactions, we investigate the instability of these homogeneous bilayer systems towards the formation of density waves by studying the poles of the density-density response function. We have also studied the collective modes of these systems and found that the dispersion of their antisymmetric collective mode signals the emergence of the density wave instability.

¹This work is supported in part by TUBA.

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Date submitted: 19 Jan 2018

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