

Abstract Submitted
for the APR21 Meeting of
The American Physical Society

On plasma modes in a strong-field plasma in magnetars¹ MIKHAIL MEDVEDEV, University of Kansas — Magnetars – the strongly magnetized neutron stars – have the surface field stronger than the Schwinger field. In such an environment, Maxwell’s equations become nonlinear due to QED effects. Magnetar magnetospheres also contain substantial amounts of plasma. Thus, there is great interest in understanding how plasma modes are modified in a super-strong field. Here we derive the general equations describing QED plasma linear modes. We discuss the properties of the low-frequency modes, for which the transitions between the Landau levels can be safely neglected. The results can be important for understanding of propagation of radio and other low-frequency waves in a magnetar magnetosphere and, perhaps, for unraveling the origin of fast radio bursts.

¹Supported by DOE via grant DE-SC0016368, EPSCOR grant DE-SC0019474 and by NSF grant PHY-2010109.

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Date submitted: 08 Jan 2021

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