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Dynamics of nematic order in ultracold dipolar gases ULRICH EBLING, MASAHITO UEDA, The University of Tokyo — We study dynamcial properties of ultracold atoms with strong dipole-dipole interactions, such as rare-earth atoms like Erbium or Dysprosium. Dipole-dipole interactions are anisotropic and can lead to the appearance of two types of nematic order in such quantum gases. Orbital nematic order is related to spatial anisotropies such as the deformation of a Fermi surface of an ultracold dipolar Fermi gas. Spin nematic order is present only in systems with spin larger than 1/2 as a higher moment of the spin operators. We study the case of a not fully polarized dipolar gas, such that the intrinsic coupling of spin and orbital degrees of freedom can lead to an interplay between orbital and spin nematic order. We investigate how this interplay can lead to a transfer between orbital and spin nematicity, similar to the transfer of spin into orbital angular momentum predicted for dipolar gases.

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