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Spin Waves and Dielectric Softening of Polar Molecule Condensates BRANDON PEDEN, Western Washington University, Bellingham, WA 98225, RYAN WILSON, CHARLES CLARK, National Institute of Standards and Technology, Joint Quantum Institute and University of Maryland, Gaithersburg, MD 20899, SETH RITTENHOUSE, Western Washington University, Bellingham, WA 98225 — We consider an oblate Bose-Einstein condensate of heteronuclear polar molecules in a weak applied electric field. This system supports a rich quasiparticle spectrum that plays a critical role in determining its bulk dielectric properties. In particular, in sufficiently weak fields, the system undergoes a polarization wave rotonization, leading to the development of textured electronic structure and a dielectric instability that is characteristic of the onset of a negative static dielectric function.

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