



Physical Sciences Seminar

Static properties of an asymmetric impurity in a dipolar BEC

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Host: Artem Volosniev (RG Serbyn)

We explore systems where an impurity potential is placed into a dipolar Bose-Einstein condensate (BEC). The dipole-impurity system can exhibit attractive and repulsive interactions depending on the direction as the dipole-dipole interaction is anisotropic. To analyze the systems, we solve the modified Gross-Pitaevskii equation. Initial calculations were done in two spatial dimensions with a dipolar impurity. Results for the impurity self-energy and the system density were obtained. In three dimensions, the impurity is a repulsive asymmetric Gaussian potential. Without an impurity, the system is elongated along one axis with the maximum density predictably in the center. The impurity causes the central density to fragment in different ways, depending on the symmetry of the impurity. These systems show an interesting interplay between the anisotropy of the medium with the anisotropy of the impurity.

Tuesday, July 18, 2023 11:00am - 12:00pm

Office Bldg West / Ground floor / Heinzel Seminar Room (I21.EG.101)



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