Abstract Submitted
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From dipolar to multipolar interactions between ultracold Feshbach molecules[1] GOULVEN QUÉMÉNER, MAXENCE LEPERS, ELIANE LUC-KOENIG, OLIVIER DULIEU, CNRS, Laboratoire Aimé Cotton — Using the multipolar expansion of electrostatic and magnetostatic potential energies, we characterize the long-range interactions between two weakly-bound diatomic molecules [1], taking as an example the paramagnetic Er_2 Feshbach molecules which were produced recently [2]. The interaction between atomic magnetic dipoles gives rise to the usual R^{-3} leading term of the multipolar expansion, where R is the intermolecular distance. We show that additional terms scaling as R^{-5}, R^{-7} and so on also appear, which are strongly anisotropic with respect to the orientation of the molecules. These terms can be seen as effective molecular multipole moments reflecting the spatial extension of the molecules which is non-negligible compared to R. [1] M. Lepers, G. Quéméner, E. Luc-Koenig, O. Dulieu, J. Phys. B: At. Mol. Opt. Phys. 49, 014004 (2016) ; [2] A. Frisch, M. Mark, K. Aikawa, S. Baier, R. Grimm, A. Petrov, S. Kotochigova, G. Quéméner, M. Lepers, O. Dulieu, F. Ferlaino, Phys. Rev. Lett. 115, 203201, (2015).

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