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Ultracold dynamics of magnetic dipolar molecules[1] GOULVEN QUÉMÉNER, MAXENCE LEPERS, JEAN-FRANÇOIS WYART, OLIVIER DULIEU, Laboratoire Aimé Cotton, CNRS, Orsay (FRANCE) — Recently, Bose-Einstein condensation of magnetic polar atoms of Er have been achieved [1]. This was soon followed by the formation of Er_2 Feshbach molecules [2], made of magneto-associated ultracold Er atoms, each of them having a strong magnetic dipole moment ($7\mu_B$). As these molecules are weakly bound, they can be highly sensitive to collisions in the ultracold gas and further lost from the trap. When the atom-atom scattering length (which characterizes the size of the Feshbach molecules) becomes comparable to the dipole-dipole length, the atoms of the molecules are well separated in the collision and the molecular dynamics is mainly mediated by the atomic magnetic dipolar interactions. Thus the anisotropy of each individual atomic dipole-dipole interactions might prevail in the molecular collision and this is what we will explore in our presentation. We will compare our findings with ongoing experiments performed in Innsbruck [2].

[1] K. Aikawa, A. Frisch, M. Mark, S. Baier, A. Rietzler, R. Grimm, F. Ferlaino, Phys. Rev. Lett. **108**, 210401 (2012).
[2] A. Frisch, M. Mark, K. Aikawa, S. Baier, R. Grimm , and F. Ferlaino, private communication (2012).

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