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Ultracold rotating molecules inside the Rydberg atom

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The goal of this project is to get the strong interaction of ultracold rotating dipole molecules. Initially, this interaction is weak at large distances. If the molecules are close enough to each other, chemical changes can occur. But we know that the Rydberg atom has a large dipole moment and a long lifetime. Therefore, we want to use it as a mediator of interaction between molecules.

We have constructed a theoretical model of the interaction of a dipole molecule with a Rydberg atom. The model was further generalized to an N-dipole system. We have studied the general properties of the interaction of dipole molecules through the Rydberg atom and considered some interesting special cases.

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