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To the editor,

We would like to submit our manuscript entitled “Molecular Spin-Flip Loss and a Dual Quadrupole Trap” to be considered for publication in Physical Review Letters.

The field of molecular physics is recently seeing groundbreaking changes through the cooling of molecules to the milli- and micro-kelvin regimes. This cooling is mainly facilitated by the advancement of powerful cooling methods for atoms to the realm of molecules. In our manuscript we demonstrate that these cold molecules may now also face a familiar challenge: spin-flip losses near the center of a magnetic trap. In contrast to the well-known Majorana spin-flip losses in atoms, these losses can be dramatically enhanced due to the dipolar nature of the molecules. By combining experiments with a sample of trapped hydroxyl radicals with a rigorous theoretical analysis, we reveal the underlying dynamics of the losses, establish their generality and present a new trapping geometry that allows for their complete removal. This allows us to realize long-lived samples of cold molecules, which constitute an ideal starting point for further cooling. Our results are thus of direct practical importance for all experiments aiming to bring molecules into the quantum regime.

Thank you for your consideration.

D. Reens, H. Wu, T. Langen, J. Ye

We would like to propose the following people as referees:

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