

## **Tuning Interactions in a Dipolar Fermi Gas of Molecules**

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The advent of a degenerate Fermi gas of polar molecules provides a stage to explore novel many-body physics. In a two-dimensional geometry we apply a precisely controlled electric field to tune the elastic dipolar interaction by several order of magnitude while suppressing reactive losses, resulting in efficient evaporation. When the electric field is used to tune excited molecular rotational states into degeneracy with the scattering threshold, we observe sharp collision resonances that give rise to three orders-of-magnitude modulation of the chemical reaction rate. Using this resonant shielding, we realize a stable three-dimensional molecular gas with tunable interactions.