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Magnetic trapping of the rare earths at milliKelvin temperatures: Pr, Nd, Tb, Dy, Ho, Er, and Tm MATTHEW HUMMON, S. CHARLES DORET, CINDY HANCOX, LINJIAO LUO, JOHN DOYLE, Department of Physics, Harvard University — We report magnetic trapping of non-S-state rare-earth atoms (Pr, Nd, Tb, Dy, Ho, Er, and Tm). We observe a suppression of the interaction anisotropy in collisions of rare-earth atoms with atomic helium. The rare-earth atoms behave effectively like S- state atoms because their unpaired electrons are shielded by two outer filled electronic shells that are spherically symmetric. For each rare-earth species, $(0.2 - 2) \times 10^{12}$ atoms are trapped at densities of $(0.2 - 8) \times 10^{12}$ cm^{-3} and temperatures of ~ 800 mK. Our results suggest that the creation of quantum degenerate gases with non-S-state atoms in a magnetic trap is possible.

Matthew Hummon

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