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**Cavity QED with group II atoms**[1] DOMINIC MEISER, MURRAY J. HOLLAND, JILA, Department of Physics, University of Colorado — Group II atoms have inter-combination lines with transition dipole moments many orders of magnitude smaller than normal optically allowed transitions. When put inside a high finesse cavity these atoms give rise to exotic cavity QED systems because of the weakness of the atom-field interaction as well as the extremely long atomic coherence times. We outline some of the general characteristics of such systems. As an application we present results on a light source that promises to have an unprecedentedly narrow linewidth in the millihertz range, surpassing the current state of the art by about two orders of magnitude. This light source could be a valuable tool for precision measurements and atomic clocks.

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