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Hyperfine resonances in metastable ^{129}Xe discharge cells[1] STEVEN W. MORGAN, TIAN XIA, YUAN-YU JAU, WILLIAM HAPPER, Princeton University — We have measured the hyperfine resonance linewidths of metastable ^{129}Xe in electrodeless rf discharge cells. The linewidths on the order of 10 kHz for Xe pressures of a few millitorr are dominated by collisions with other Xe atoms and no buffer gases are present. Additional contributions come from collisions with the walls as well as with impurities which may be drawn off the cell walls due to the harsh plasma environment. If used for small atomic clocks, metastable noble gases could require less power and would be relatively insensitive to temperature variations when compared with alkali metal atoms.

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