Two examples of long lived metastable systems: Ar-HCl (v=1) and Ar-DF (v=1)

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High resolution optothermal spectra have been obtained for the Ar-HCl (v=1) and Ar-DF (v=1) complexes. In both complexes, the vibrational predissociation lifetime is found to be greater than the time of flight of the complexes from the point of excitation by an F-center laser to the bolometer detector. This places a lower limit on the lifetime of 0.6 ms, in analogy to earlier reported Ar-HF (v=1) measurements. In addition to this, Stark spectra have been obtained for both complexes to determine the vibrational excited state dipole moments. These will be compared with the theoretical values