A MOLECULAR BEAM OPTICAL STARK STUDY OF THE (1,0) $X^4\Delta_{7/2} \leftarrow F^4\Delta_{7/2}$ BAND SYSTEM OF IRON MONOHYDRIDE, FeH[a].

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A supersonic molecular beam sample of iron monohydride, FeH, has been generated using a laser ablation/chemical reaction generation scheme and probed using near natural line width limited optical Stark spectroscopy utilizing laser induced fluorescence detection. The observed Stark splitting in the Q(3.5) and R(3.5) lines of the (1,0) $X^4\Delta_{7/2} \leftarrow F^4\Delta_{7/2}$ transition were analyzed to determine values for the magnitudes of the permanent electric dipole moments, $|\mu|$, which were found to be 2.63(1) D and 1.30(2) D for the $X^4\Delta$ (v=0) and $F^4\Delta$ (v=1) states, respectively. The Λ-doubling in the low-J levels of the (v=1) $F^4\Delta_{7/2}$ state is modeled. Comparisons with *ab initio* theoretical predictions and a simple molecular orbital correlation model are made.

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