

ROTATIONALLY RESOLVED ELECTRONIC SPECTRUM OF THE PARA-DIFLUOROBENZENE-NITROGEN VAN DER WAALS COMPLEX: STRUCTURE AND INTERNAL MOTION<sup>a</sup>

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The rotationally resolved  $S_1 \leftarrow S_0$  fluorescence excitation spectra of p-difluorobenzene and its  $N_2$  complex have been observed. While the spectrum of pDFB is pure b-type, the spectrum of the  $N_2$  complex is a superposition of two pure c-type spectra that result from the internal rotation of the  $N_2$  molecule. The analysis reveals that  $N_2$  molecule lies above the center of the ring plane in the  $S_0$  state; this distance decreases in the  $S_1$  state. The preferred orientation and barrier to internal rotation in the two electronic states are also different. A full discussion of the factors responsible for the differences will be given.

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<sup>a</sup>work supported by NSF.