

EXPERIMENTAL AND THEORETICAL STUDY OF THE BOUND-FREE  $G^2\Sigma(4p) \leftarrow X^2\Pi(3p)$  TRANSITION OF AlAr

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The  $G^2\Sigma(4p)$  state of AlAr has been observed by both 1+1 and 2+1 resonant multiphoton ionization from the  $X^2\Pi(3p)$  state. The G state is a dissociative state resulting in a broad but asymmetric band peaked at  $33920\text{ cm}^{-1}$ , detectable by action spectroscopy upon one- and two-photon absorption. The atomic Al 3p-4p transition is forbidden, and molecular AlAr transitions between states arising from these states are primarily two-photon in character due to the weak mixing of Al-atom configurations. Simulations of both the one- and two-photon bands using ab initio potential curves and dipole moment functions calculated by MR-CI methods are in good agreement with observations.