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A model of N_2 extreme-ultraviolet photoabsorption and dissociation ALAN HEAYS, Leiden University, The Netherlands, BRENTON LEWIS, STEPHEN GIBSON, The Australian National University — The nitrogen molecule is a long-studied and difficult problem in molecular spectroscopy, and many important details of its interaction with radiation remain unexplained. A principal problem of continuing interest concerns the resonant photoabsorption and resultant predissociation of N_2 when exposed to extreme-ultraviolet radiation. A model of the excited states of N_2 has been developed in order to quantify their interactions and reproduce photoabsorption and photodissociation cross sections between 100000 and 118500 cm^{-1} (100 and 84 nm) . This solves the radial Schroedinger equation within a coupled-channels formulation for new diabatic potential-energy curves, homogeneous and heterogeneous state mixing, and electronic transition moments for the optically allowed transitions. The accidental predissociation of $^1\Pi_u$ states between 100000 and 112500 cm^{-1} has been quantitatively modelled by spin-orbit coupling these to a set of $^3\Pi_u$ and $^3\Sigma_u^+$ states which includes unbound members. Following reference to a large experimental database, the model is both accurate and comprehensive and may be used to simulate synthetic cross sections suitable for use in high-resolution photochemical models of atmospheric and astrophysical environments.

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