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[Poster]

New Molecular Datasets for Modeling Astrophysically Relevant Radiative Processes

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Abstract: This work investigates radiative processes, with particular emphasis on photodissociation, in asymmetric molecular systems containing hydrogen and silicon. The study provides a comprehensive set of calculated molecular data, including the characterization of relevant electronic states and the determination of photodissociation cross sections over a broad range of EUV and UV photon wavelengths. Temperature-dependent photodissociation rate coefficients are derived by combining the calculated cross sections with appropriate radiation fields. To facilitate their implementation in numerical models, analytical fitting expressions are developed for both the photodissociation cross sections and the corresponding spectral rate coefficients. The resulting data provide useful input for photochemical and plasma-chemistry models and can contribute to a more accurate description of molecular processes in laboratory plasmas and astrophysical environments.

Keywords: data, modeling, molecules

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