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A State-to-State Model for High-Temperature N₂-CH₄ Plasmas DZMITRY TSYHANOU, MÁRIO LINO DA SILVA, VASCO GUERRA, JORGE LOUREIRO, Instituto de Plasmas e Fusão Nuclear - Laboratorio Associado, Instituto Superior Tecnico, 1049-001 Lisboa, Portugal — Since the landing of the space probe Huygens on the surface of Titan in 2005, a renewed interest exists for studies of N₂-CH₄ Plasmas. The atmosphere of Titan is composed from 98% N₂-2% CH₄ and therefore, chemical kinetics involving the N₂ molecule is predominant. In particular, the reaction CN+N $< - > N_2+C$ is known to significantly affect the radiation of the CN Violet system, which is often considered as an important system for diagnostics of these plasmas. This reaction depends strongly from the concentration of atomic N, which in turn is correlated to the dissociation dynamics of N₂. In this work we show that the application of an improved multiquantum FHO model for dissociation, as opposed to the traditional first-order SSH approach, improves the predicted concentrations of the radiative states of CN.

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