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Statistical product-state distributions for ultracold exoergic reactions in external fields[1] MAYKEL LEONARDO GONZALEZ-MARTINEZ, Laboratoire Aime Cotton, CNRS, Universite Paris-Sud XI, Bat. 505, Campus d'Orsay, 91405 Orsay, LAURENT BONNET, PASCAL LARREGARAY, Institut des Sciences Moleculaires, CNRS, Universite Bordeaux 1, UMR 5255, 33405 Talence, France, THEOMOL (LAC) TEAM, CHIMIE THEORIQUE (ISM) TEAM — The first ultracold chemistry experiments were recently performed at JILA, Colorado. Using an ultracold gas of KRb molecules, the group demonstrated strong effects on reaction rates due to quantum statistics, external electric fields, and reduced dimensionality/orientation. While Quéméner and Bohn provided the theoretical interpretation of the observed loss rates, Idziaszek and coworkers, and Gao have developed simple quantum models for reaction rates and identified different universality classes. The most important open question is that of product-state distributions. These are very sensitive to the details of the reaction dynamics and could lead to a deeper understanding of the underlying physics. A priori, a rigorous description of these reactions can be derived from the quantum-mechanical formalism of Tscherbul and Krems. Yet, as argued by Mayle et al., the huge number of rovibrational states involved makes such approach impractical for most cases of current experimental interest. I will discuss our efforts in deriving statistical product-state distributions for ultracold exoergic reactions in external fields. These can be used as benchmarks for the funding assumptions of the theory and provide tests for the statistical arguments of Mayle et al.

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