Heavy atom tunneling in chemical reactions at ultracold temperatures\textsuperscript{1} P.F. WECK, N. BALAKRISHNAN, University of Nevada Las Vegas, Dept. of Chemistry — Over the last few years, experimental methods such as the buffer-gas cooling or the photoassociation techniques have succeeded in producing gases of cold and ultracold molecules. These remarkable technical achievements open new perspectives in the study of intermolecular interactions and by the same token raise new concerns about rovibrational relaxation and chemical reactivity of molecules in the ultracold regime. In the present work, we report quantum scattering calculations of atom-diatom reactions at cold and ultracold temperatures. Specifically, we investigate the H + LiF and Li + HF collisions at ultralow energies for which the reactions proceed by quantum tunneling of the exchanged atom through a barrier along the reaction path. Particular attention is paid to the resonance structure originating from quasibound states of the Li...FH and H...LiF van der Waals complexes.

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