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Quantum tunneling isotope exchange reaction $H^2 + D^- \rightarrow HD + H^{-1}$ CHI HONG YUEN, University of Central Florida, MEHDI AYOUZ, LGPM, CentraleSupelec, Universit Paris-Saclay, ERIC ENDRES, OLGA LAKHAMANSKAYA, ROLAND WESTER, Institut fr Ionenphysik und Angewandte Physik, Universitt Innsbruck, VIATCHESLAV KOKOOULINE, University of Central Florida — The tunneling reaction $H_2 + D^- \rightarrow HD + H^-$ was studied in a recent experimental work at low temperatures (10, 19, and 23 K) by Endres *et al.*[1]. An upper limit of the rate coefficient was found to be about 10^{-18} cm^3/s. In the present study, reaction probabilities are determined using the ABC program developed by Skouteris *et al.*[2]. The probabilities for ortho-H_2 and para-H_2 in their ground rovibrational states are obtained numerically at collision energies above 50 meV with the total angular momentum $J = 0$ - 15 and extrapolated below 50 meV using a WKB approach. Thermally averaged rate coefficients for ortho- and para-H_2 are obtained; the largest one, for ortho-H_2 is about 3.1×10^{-20} cm^3/s, which agrees with the experimental results. [1] Endres *et al.* PRA 95, 022706 (2017) [2] Skouteris *et al.* Comput. Phys. Commun. 133, 128 (2000)

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