## Effects of reagent rotation on interferences in the product angular distributions of chemical reactions

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Figure S1: QCT *J*- $\theta$  deflection function resolved in  $\Omega$ ,  $(2J + 1) P_r(J, \theta; \Omega)$  sin  $\theta$  for the H + D<sub>2</sub> ( $\nu$ =0, j=2)  $\rightarrow$  D + HD ( $\nu$ =1, j=0) reaction at  $E_{coll} = 1.97$  eV. Sketches of the most characteristic quasiclassical mechanisms are labelled in the figure as 1 (ear), 2, 3, 3' and 4 (the last three form the spiral). <sup>1, 2</sup> Sketches displaying these mechanisms are also displayed. The mechanism labelled as (3) and (3') are similar; the former with slightly smaller impact parameters and attacking angles somewhat closer to linearity.



Figure S2: Origin of the multiple peaks in backward scattering for j=1. The top panels show the joint QCT J- $\theta$  deflection function resolved in  $\Omega$ ,  $(2J + 1) P_r(J, \theta; \Omega) \sin \theta$ . The bottom panels show the decomposition of the QM angular distributions from the contributions of various sets of J. The notation DCS $(J_1-J_2)$  means that the DCS is constructed by including partial waves in the range  $[J_1, J_2]$  and the corresponding cross terms. In each case, the shaded curve corresponds to the global DCS  $|v, j, \Omega\rangle$  state.

## **References:**

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