Sinusoidal Regge Oscillations from Short Lived Resonances\textsuperscript{1}

D. SOKOLOVSKI, The Queen’s University of Belfast, UK, Z. FELFLI, A.Z. MSEZANE, Clark Atlanta University, SOKOLOVSKI COLLABORATION, FELFLI/MSEZANE TEAM — It is well known that a resonance with a large angular life can produce sharp Breit-Wigner peaks in the energy dependence of integral cross sections \cite{1,2}. Here we show that a short-lived resonance whose angular life is of order of one full rotation may produce a different kind of contribution to the integral cross section. This contribution has a sinusoidal form and its frequency is determined by the rotational constant of the complex. As one of the examples, we analyze the Regge oscillations observed in numerical simulations of the $F + H_2(v = 0, j = 0, \Omega = 0) \rightarrow FH(v' = 2, j' = 0, \Omega' = 0) + H$ reaction. In particular, we show that these oscillations are produced by two overlapping resonances located near the transition state and the van der Waals well, respectively \cite{3}.

\textsuperscript{1}AZM and ZF are supported by US DoE Division of Chemical Sciences, Office of Basic Energy Sciences, Office of Energy Research.

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