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Sinusoidal Regge Oscillations from Short Lived Resonances[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 [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 sinousoidal 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 [3].

[1] J. H. Macek, *et al.*, Phys. Rev. Lett., **93**, 183202, (2004).
[2] Z. Felfli *et al.*, J. Phys. B **39**, L353 (2006)
[3] D. Sokolovski, D. De Fazio, S. Cavalli and V. Aquilanti, J. Chem. Phys. (2007) (submitted).

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