

Abstract Submitted
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Interchannel coupling effects in multi-channel potential scattering¹ DMITRI SOKOLOVSKI, University of Basque Country, Spain and Queen's University, UK, ZINEB FELFLI, ALFRED Z. MSEZANE, Clark Atlanta University — There has been an increasing interest in resonance effects which arise when collision partners form a long-lived intermediate complex. An isolated resonance can be associated with a pole of the scattering matrix either in the complex energy or the complex angular momentum (CAM) plane. Observables of interest such as integral and differential cross sections are conveniently described by CAM (Regge) poles. Here a direct method for calculating Regge pole positions and residues, suitable for systems with a relatively small number of channels is proposed. The method is applied to a simple model designed to mimic electron-atom scattering at energies between the first and the second excitation thresholds. It is shown that interchannel coupling splits degenerate Regge trajectories into ones corresponding approximately to the two adiabatic potentials used. Nonadiabatic effects are found to be responsible for self-intersection of a Regge trajectory [1], not observed in single channel scattering. Envisioned is the possibility to probe Regge resonances and Feshbach resonances occurring in Bose-Einstein condensates.

[1] D. Sokolovski, Z. Felfli and A. Z. Msezane, Physics Letters A 376, 733 (2012)

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