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One-dimensional three-body problem with Feshbach resonance interactions VLADIMIR YUROVSKY, School of Chemistry, Tel Aviv University — A problem concerning collisions of cold atoms under tight cylindrical confinement is considered. A Feshbach resonance in two-body collisions is described by a two-channel zero-range interaction, one of them being a closed (molecular) channel. The interaction parameters are related to three-dimensional scattering parameters [1]. A neglect of collisions of the closed channel molecule with the third atom allows the elimination of the closed channel in the three-body problem, reducing the interaction to a one-channel zero-range one with an energy dependent strength. Unlike the problem with energy independent strength (the exactly soluble Lieb-Liniger-McGuire problem [2,3]) the resonant problem does not allow an exact Bethe-ansatz solution. This problem is analyzed by a numerical solution of the Faddeev-Lovelace equations. The results demonstrate that the internal symmetry of the Lieb-Liniger-McGuire problem is broken, and the resonant scattering allows for reflection in elastic atom-molecule collisions, dissociation in inelastic collisions, and three-body association. 1. V. A. Yurovsky, Phys. Rev. A **71**, 012709 (2005). 2. E. H. Lieb and W. Liniger, Phys. Rev. **130**, 1605 (1963). 3. J. B. McGuire, J. Math. Phys. **5**, 622 (1964).

Vladimir Yurovsky
School of Chemistry, Tel Aviv University

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