

Abstract Submitted  
for the DAMOP16 Meeting of  
The American Physical Society

**Capture into resonance and phase space dynamics in optical centrifuge**<sup>1</sup> TSAFRIR ARMON, LAZAR FRIEDLAND, Hebrew Univ of Jerusalem  
— The process of capture of a molecular ensemble into rotational resonance in the optical centrifuge is investigated. The adiabaticity and phase space incompressibility are used to find the resonant capture probability in terms of two dimensionless parameters  $P_{1,2}$  characterising the driving strength and the nonlinearity, and related to three characteristic time scales in the problem. The analysis is based on the transformation to action-angle variables and the single resonance approximation, yielding reduction of the three-dimensional rotation problem to one degree of freedom. The analytic results for capture probability are in a good agreement with simulations. The existing experiments satisfy the validity conditions of the theory.

<sup>1</sup>This work was supported by the Israel Science Foundation grant 30/14.

Tsafrir Armon  
Hebrew Univ of Jerusalem

Date submitted: 28 Jan 2016

Electronic form version 1.4