

## Pseudo harmonic oscillator potential

Iacob, F.<sup>1</sup> 

<sup>1</sup>West University of Timisoara,  
E-mail [felix.iacob@e-uvt.ro](mailto:felix.iacob@e-uvt.ro)

It is discussed and shown an analytical results for a chemical potential that can be assimilated to a harmonic oscillator. It can be applied to describe particles that are in a trap created in the plasma medium. Depending on the specificity of the bounding interaction this potential can be modified according to the states of a particle trapped inside. Unlike the classical harmonic oscillator potential, which is an infinitely deep well, the presented potential is tunable and the trapped particle can escape above a certain energy. This model can be used to describe particle trapping, such as electrostatic trapping in plasma. This is an essential effect that should be added to the description of the Dynamics of the plasma fluid and other collective systems. Furthermore, a damped harmonic oscillator can be a successful model to describe the adiabatic cooling process of a trapped atomic/molecular system.

This presentation's goals are to illustrate the potential's analytical construction and demonstrate how its parameters can be changed.

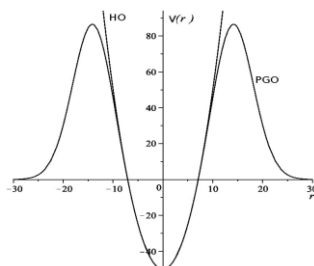


Fig. 1. Pseudo gaussian potential energy curve versus harmonic oscillator

### References

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- F. Iacob, Relativistic pseudo-Gaussian oscillators, *Physics Letters A* 374 (11-12), 1332-1335