

## Quadrupole mass filter with fuzzy initial conditions

### ABSTRACT

The employment of the fuzzy method to solve differential equations has been well studied. In this article, Mathieu differential equations of the quadrupole mass filter (QMF) have been solved by using the fuzzy method. This method has not been yet investigated in the QMF with fuzzy initial conditions. We survey the physical properties of the confined ion. The results of numerical simulations are presented and discussed.

**Keyword:** Fuzzy initial conditions; Ion trajectory; Mathieu differential equations; Ordinary differential equation; Quadrupole mass filter