

In the thesis, elementary problems observable in a temperature variable linear multipole trap are described. Those elementary processes that are important for low-temperature interstellar plasma are briefly summarized in the first part. In the same chapter, a theory about particles-confinement in a Paul trap is shortly explained as well. In the second part of the work, the Atomic Beam 22-Pole Trap experimental apparatus from the Physical Institute of the Nature Science Faculty of the Technical University in Chemnitz is described. In the last section, first measurements using the mentioned apparatus are described and interpreted.