Title: Implementation of ion imaging technique in experiments with free molecules, clusters and nanoparticles

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Abstract: The experimental work is focused on implementation of novel techniques to study clusters and nanoparticles in molecular beams. A new experimental system was tested, which combines the technique of velocity map ion imaging with pulsed molecular beam source. The same method and new mass spectrometer were implemented on the apparatus with molecular beam of size selected clusters. The new methods were used to study environmental effects on photo and electron induced chemistry. The most important results concerns on influence of expansion conditions on the structure of formed neutral clusters of HBr and C_2H_2. Results of experiments with HNO_3 and CF_2Cl_2 molecules are then crucial for understanding heterogeneous processes in the Stratosphere.

Keywords: ion imaging, mass spectrometry, molecular beams, photochemistry, nanoparticles