CFEL SCIENCE

SEMINAR

23rd January 2020 - 10:00 h

CFEL – Building 99, seminar room I+II (ground floor)

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Molecules under the reaction microscope

While an atom is a fully symmetric system, diatomic molecules are rotationally symmetric around the molecular axis. By adding more atoms the complexity increases, while symmetries are being lost. One very special class of this “complex” molecules are so-called chiral, with a lower limit of at least 4 atoms. They exist, similar to our hands, in a left and a right version. These enantiomers have the same physical properties (melting point, density, ionization energy etc.), distinguishing left and right poses a major challenge for scientists.

Today’s multi particle coincidence techniques as the COLTRIMS reaction microscope open a new window to investigate molecular chirality. Energy and angular resolved measurements of electrons and/or ions especially those in coincidence give new insights. For example the structure and/or handedness can be determined utilizing Coulomb Explosion Imaging. A few showcase examples will be presented and a broader outlook on future perspectives employing this technique, especially in terms of boundary conditions, time scale, nuclear dynamics and efficiency, will be given.

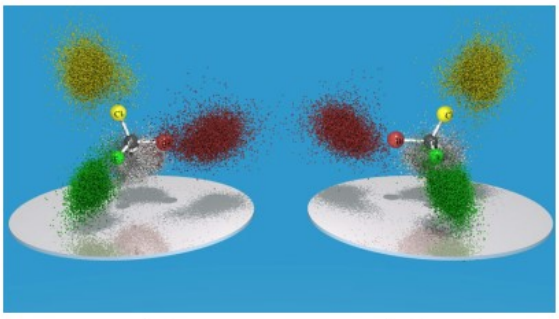

Fig. 1: Measured linear momenta of the various atomic ions in 5-fold ionic fragmentation of S-CHBrClF (left) and R-CHBrClF (right).

Host: Melanie Schnell / CFEL Molecular and Ultrafast Science Seminar