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## Measuring ion-induced electron emission and molecular fragmentation using a Velocity Map Imaging spectrometer

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The study of ion collision with biologically relevant molecules in the gas phase has received increasing interest in recent years in parallel with the development of ion beam therapy. Indeed, these studies help understanding the fundamental mechanisms involved at the molecular level such as fragmentation and electron emission. To study such processes, we have recently built an experimental set-up where the molecular target beam of biomolecules produced with a two-stage effusion cell crosses perpendicularly the projectile ion beam provided by the different GANIL beamlines (ARIBE, IRRSUD or SME). The charged particles (either electrons or fragment cations) emitted in the collision are extracted by a Velocity Map Imaging (VMI) spectrometer and detected with microchannel plates coupled to a phosphor screen. The electrode arrangement of the VMI spectrometer acts as an electrostatic lens focusing particles with the same initial velocity vector into the same position on the detector regardless of their initial position (within the small interaction volume). The 2D image observed on the detector is then processed using an inverse Abel transform algorithm in order to deduce the number of particles (electrons or ionic fragments) emitted as a function of their energy and their emission angle. In this presentation, recent measurements of absolute cross sections for electron emission from the nucleobases uracil and adenine upon collision with carbon ions ( $0.98\text{MeV/u-C4+}$  and  $13.7\text{MeV/u-C5+}$ ) will be presented. Moreover, preliminary data on ion-induced fragmentation processes will be discussed along with the future improvement of the set-up.

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