

Status of the GSI microbeam facility for cell irradiations with single Ions

Heiss M, Fischer BE, Cholewa M

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In the last 15 years, the GSI microprobe has been used for different applications like ion lithography, micromechanics or the investigation of effects of radiation on microelectronics. With its ability to focus ions from carbon to uranium with energies between 1.4 MeV/nucleon and 11.4 MeV/nucleon into a beam spot with a diameter of 0.5 μm , it is also of interest for the irradiation of single biological cells. Compared to the existing single-cell-irradiation facilities, which use mainly light ions like hydrogen or helium, the range of the LET can be extended considerably with heavy ions. As a focusing microprobe, it also offers a smaller beam spot and a better-defined LET because the particles are not scattered inside a collimator. As an additional bonus with a focused microprobe we expect a higher throughput since the microbeam can be deflected to the position of the cells instead of having to move the cells into the beam position. Therefore during the last 3 years, a number of new components were developed to expand the ability of the GSI microprobe to irradiate cells.