

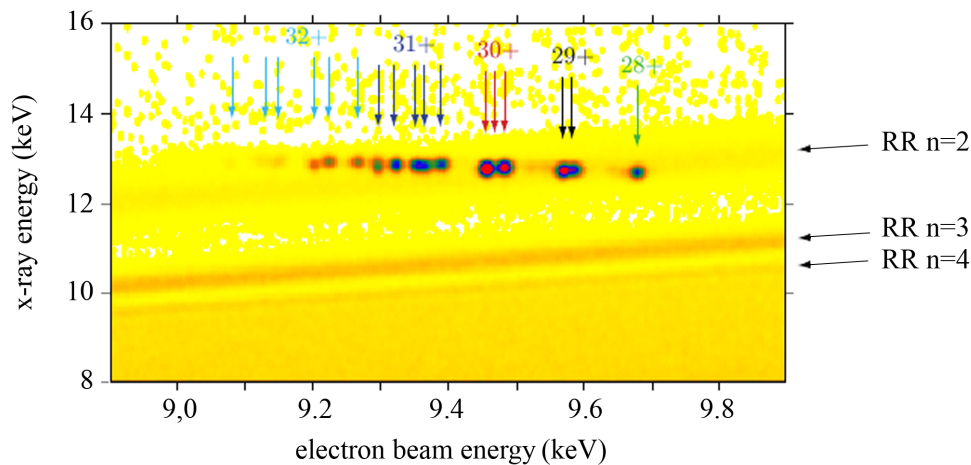
TERX DETECTION SYSTEM

- TIME AND ENERGY RESOLVED X-RAY MEASUREMENT -



TERX Detection Box

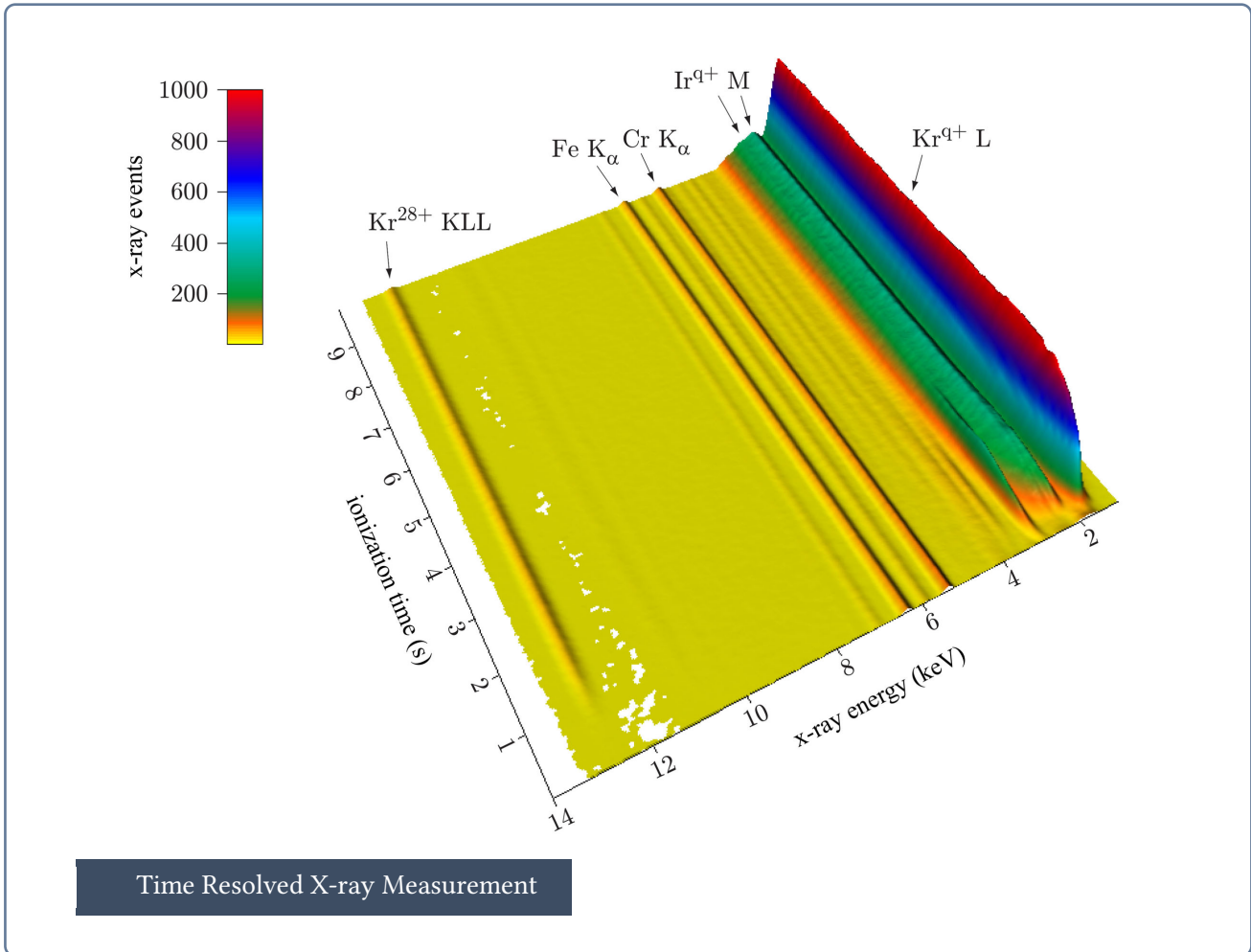
The TERX detection system is used to measure x-ray spectra at Electron Beam Ion Sources in dependence on the ionisation time and on the electron energy. Therefore, it controls the source potential and trap cycle of the ion source. X-ray events are counted directly from an x-ray detector and sorted in a time or energy matrix, depending on the respective measurement mode.



Energy Resolved X-ray Measurement

In detail, the energy resolved x-ray measurement is done by a stepwise increase of the ion trap potential controlled by the TERX electronics. The x-ray events are stored and are labelled corresponding to each set trap potential. An example for an energy resolved x-ray measurement is shown in the graph displayed above. The measurement of the dielectronic recombination (DR) and radiative recombination (RR) of krypton ions was carried out with the provided data acquisition software.

In the time resolved x-ray measurement the x-ray detector sends its information to the TERX system which is connected to the ion source trap timing and sorts the x-ray signals into a time-energy matrix. An example for a time resolved x-ray measurement of Kr ions in a Dresden EBIS is given in the following graph.



TERX SYSTEM PARAMETERS

minimum time resolution	1 ms
maximum x-ray detector resolution	12 bit
maximum electron beam energy resolution	16 bit
maximum count rate	10000 cps

REQUIREMENTS FOR DETECTOR ATTACHMENT

detector interface signal type	5V TTL
accessible output channels	'Strobe' - incoming x-ray signal 'High Load' - more x-ray signals arrive before first signal is read-out
accessible input channels	12 bit output of x-ray signals according to energy 'Clear 1' - clearing 'Strobe' and 12 bit x-ray output 'Clear 2' - clearing the 'High Load' channel

CONTACT

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