

Abstract Submitted
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X-ray laser spectroscopy of heavy ions at the GSI, Darmstadt, Germany ALEXANDER MAYR, RUSTAM BEREZOV, JOACHIM JACOBY, J.W. Goethe-University, Frankfurt, THOMAS KUEHL, OLGA ROSMEJ, GSI, Darmstadt, BERND SICHERL, J.W. Goethe-University, Frankfurt, DANIEL URESCU, GSI, Darmstadt, BERNHARD ZIELBAUER, MBI, Berlin, DANIEL ZIMMER, J. Gutenberg-University, Mainz — As a branch of the PHELIX laser project at GSI, a 13.9 nm x-ray laser is developed. Using this x-ray laser, spectroscopic measurements on highly-charged heavy ions will be made. At GSI, ions up to uranium can be provided in specific charge states by the fragment separator FRS and then stored and cooled in the experimental storage ring ESR. The upcoming FAIR facility will also produce many radioactive nuclei. The unique combination of heavy-ion beam and x-ray laser allows the accurate spectroscopic rating of quantum-mechanical states of atomic nuclei and the comparison of this information with theoretical predictions. This will be achieved by the use of lithium-like heavy ions because for these four-body systems the models of quantum electrodynamics give results which are precise enough. The paper will give information about the realisation of the experimental concept, the current state of the x-ray laser setup and the development of the corresponding detection systems.

Alexander Mayr
J.W. Goethe-University, Frankfurt

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