

## **Tests of Relativity and Bound-State QED at the Experimental Storage Ring ESR**

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Laser spectroscopy on relativistic beams of highly charged ions offers many possibilities to test fundamental interactions and symmetries. At the ESR in Darmstadt a series of experiments have recently been completed with the goal to test time dilation in special relativity and bound-state QED in strong fields. Time dilatation was tested with a beam of  $\text{Li}^+$  ions at 0.34% of the speed of light. This experiment is the continuation of previous experiments with lower energies at the Test Storage Ring in Heidelberg. The test of strong-field QED was performed with hydrogen-like and lithium-like Bi-209. Here, the ground-state hyperfine transition was observed for the first time after various attempts in the last decade. This is the first step towards more accurate determinations of the transition frequencies in a Penning trap that is currently being commissioned at GSI.