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## Prospects of positron and positronium physics with a highly intense low energy positron source

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We report on the possible use cases for an highly intense low energy positron source in the light of the FCC-ee project. Slow positrons can be used to create the purely leptonic hydrogen-like positronium (Ps) atom, the bound state of an electron and a positron. Since it does not contain a hadronic nucleus, it is a privileged system to research bound-state QED. Notably, theoretical results regarding Ps exceed the current experimental precision, which is why new fundamental precision experiments on Ps are very interesting. But also the possibility of Bose-Einstein condensates with Ps becomes more likely with a more intense positron source, and ultimately the first steps towards a gamma-ray laser may be investigated. Ps is a symmetric matter-antimatter system which enables direct tests on CPT-symmetry and possibly also on the WEP by means of free-fall experiments in a well controlled environment.

As a more user-oriented case, slow positrons can be used as non-destructive nanoprobe for defects in all types of materials, and an intense source might develop towards an useful tool for industry to test samples with high throughput.

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