

Ultracold Electron Source

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[Home](#) | [Session Index](#) | [Classification Index](#) | [Authors Index](#) | [List of Institutes](#)

[A](#) [B](#) [C](#) [D](#) [E](#) [F](#) [G](#) [H](#) [I](#) [J](#) [K](#) [L](#) [M](#) [N](#) [O](#) [P](#) [Q](#) [R](#) [S](#) [T](#) [U](#) [V](#) [W](#) [X](#) [Y](#) [Z](#)

Taban, G.

Paper	Title	Page
MOP111	Ultracold Electron Source	

- **G. Taban**, B. Fleskens, O.J. Luiten, M.P. Reijnders, E.J.D. Vredembregt, M.J. de Loos
TUE, Eindhoven
- **S.B. van der Geer**
Pulsar Physics, Eindhoven

Ultracold electron sources, which are based on near-threshold photo- and fieldionization of a cloud of laser-cooled atoms, offer the unique combination of low emittance and extended source size, enabling pulsed operation in unprecedented brightness regimes*. Possible applications are single-shot, ultrafast electron diffraction of macromolecules and X-ray quantum free electron lasers. Here we present measurements of the effective temperature of such a pulsed electron source employing rubidium atoms that are magneto-optically trapped at the center of an accelerator structure**. Transverse source temperatures ranging from 200K down to 10K are demonstrated, controllable with the wavelength of the ionization laser.

* **B. J. Claessens et al., Phys. Rev. Lett. 95, 164801 (2005).**

** **G. Taban et al., EPL 91, 46004(2010).**

