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## APPLICATIONS OF SUPER-HIGH INTENSITY LASERS IN NUCLEAR ENGINEERING

**Rainer Salomaa, Antti Hakola, and Marko Santala**

Advanced Energy Systems  
Helsinki University of Technology  
POBox 4100, FIN-02015 TKK, Finland  
E-mail: *Rainer.Salomaa@tkk.fi*

### ABSTRACT

Laser-plasma interactions arising when a superintense ultrashort laser pulse impinges a solid target creates intense partly collimated and energy resolved photons, high energy electron and protons and neutrons. In addition the plasma plume can generate huge magnetic and electric fields. Also ultra short X-ray pulses are created. We have participated in some of such experiments at Rutherford and Max-Planck Institute and assessed the applications of such kind as laser-driven accelerators. This paper discusses applications in nuclear engineering (neutron sources, isotope separation, fast ignition and transmutation, etc). In particular the potential for extreme time resolution and to partial energy resolution are assessed.