

## LIGHTWEIGHT NEUTRON DOSIMETER

**A lightweight cylindrical neutron dosimeter, of the Anderson-Brown type, able to work in continuous, quasi-continuous and pulsed neutron fields.**

Partners to further develop the system and/or to establish commercial agreements along with technical cooperation are sought.

### The Challenge

Neutrons can dominate the total radiation dose received by workers, patients and public. The next generation medical and research facilities requires improved neutron detection techniques in terms of energy sensitivity, beam time structure, portability and capabilities for remote and real time diagnostic.

The Current commercial solutions:

- Classical technology: radiation sensor (design from the 60's), analog electronics for acquisition/read-out (design from 90-2000's)
- Limited portability: 9-18 kg per sensor unit.
- Poor response for high neutron energies (> 20MeV).
- Not well suited for complex quasi-continuous or pulsed neutron fields.

### The Technology

**Modern design technology:** numerically assisted optimization of the detection module.

**Novel concept:** Implementation of new acquisition technology based on the "charge integration" concept to allow detection of pulsed fields.

**Make it digital:** Acquisition and readout based on digital electronics and apps (smart

### Innovative advantages:

- Lightweight neutron dosimeters for application in the energy range from thermal up to 10 MeV (3.5 kg) or 10 GeV (10.5 kg), respectively.
- Response according to recommendation ICRP74 or the new ICRU-RC26.
- Temporally resolved neutron dosimetry: fully suited for continuous and pulsed (>1 uSv/bunch) neutron fields.

### Current stage of development

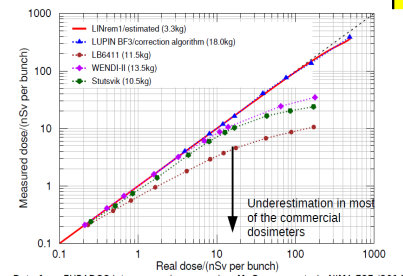
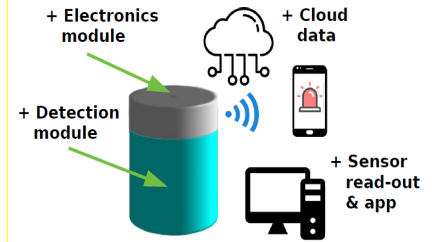
TRL7 demonstration in progress: lightweight system prototype including dedicated electronics and demonstrated in relevant environments.

### Applications and Target Market

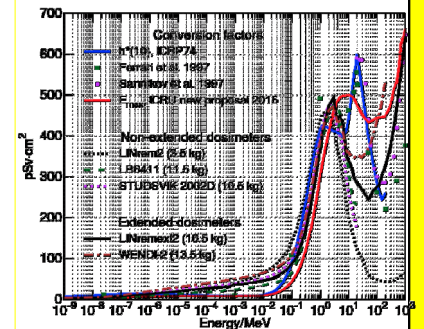
- ⇒ **Big science projects:** next generation particle accelerators, laser driven facilities, nuclear fusion.
- ⇒ Particle therapy facilities: radiotherapy services, proton and ion therapy, flash therapy.
- ⇒ **Industrial applications:** nuclear reactors, neutron irradiation facilities, spent fuel storage Installations.

### Reference number

MKT20210179\_G



Data from EURADOS intercomparison exercise, M. Caresana et al., NIMA 737 (2014)



### Business Opportunity

Technology available for licensing with technical cooperation

### Patent Status

Priority application

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