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Magnetron-driven superconducting linacs for UNF transmutation

Wednesday 4 June 2025 16:00 (2 hours)

We describe a program to develop 805 MHz magnetron power sources to enable a cost effective one GeV Linac that is capable of CW operation at greater than 50 MW beam power. Compared to the klystrons now used at the ORNL SNS, magnetrons have about a factor of ten lower capital cost ($1/Wvs10$/W) and much higher wall power to beam power efficiency (almost 90% vs 50%).
Two applications under consideration to ARPA-E are to use a spallation target driven by a high power proton Linac to produce copious neutrons to induce transmutations of all actinides in UNF for energy production or to destroy unwanted elements that have been extracted from stored UNF.

Footnotes

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Author: NEUBAUER, Michael (Muons, Inc)

Co-authors: KAZAKEVICH, Grigory (Muons, Inc); WESSEL, Jerry (Richardson Electronics Ltd); POPOVIC, Milorad (Muons, Inc); JOHNSON, Rolland (MuPlus, Inc.); BLASSICK, Thomas (Richardson Electronics Ltd)

Presenter: NEUBAUER, Michael (Muons, Inc)

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