

GFA & SwissFEL Accelerator Seminar

Thorium fuelled nuclear power – or how accelerators can save the planet

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Professor Roger Barlow
University of Huddersfield, U.K.

Thorium can provide a fuel source for nuclear fission reactors, which has many advantages over traditional uranium/plutonium power: it can greatly reduce the problems of safety, waste, and proliferation. Thorium can be deployed in various ways, many of which include an accelerator coupled to the reactor to provide an extra source of neutrons through spallation. The talk describes the thorium cycle and its similarities and differences to existing uranium systems. It surveys the different schemes proposed, including the 'Energy Amplifier', and the advantages of an Accelerator Driven Subcritical Reactor. The requirements for the accelerator are quite challenging (though not impossible), and these are described. The talk also considers the issues of sustainability, waste transmutation, safety in the light of Fukushima, and proliferation resistance, where there is currently much debate. Finally, it describes possible ways forward to thorium power in the future.

