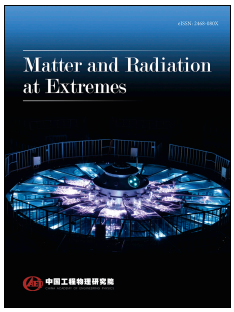
Accepted Manuscript



Review of Accelerator Driven Heavy Ion Driven Nuclear Fusion

Ingo Hofmann

PII: S2468-080X(17)30133-4

DOI: 10.1016/j.mre.2017.12.001

Reference: MRE 70

To appear in: *Matter and Radiation at Extremes*

Received Date: 1 December 2017

Accepted Date: 15 December 2017

Please cite this article as: I. Hofmann, Review of Accelerator Driven Heavy Ion Driven Nuclear Fusion, *Matter and Radiation at Extremes* (2018), doi: 10.1016/j.mre.2017.12.001.

Review of Accelerator Driven Heavy Ion Driven Nuclear Fusion

INGO HOFMANN
GSI Helmholtzzentrum für Schwerionenforschung GmbH
Planckstr. , 64291 Darmstadt, Germany[1]
i.hofmann@gsi.de

Abstract:

Using high energy accelerators for energy production by nuclear fission goes back to the 1950's with plans for "breeder accelerators" as well as with early ideas on subcritical reactors, which are currently pursued in China and other countries. Also, fusion came in, when the idea emerged in the mid 1970's to use accelerators and their highly time and space compressed beams in order to generate the extremely high density and temperatures required for inertial fusion energy production. Due to the higher repetition rates and efficiencies of accelerators, this was seen as a promising alternative to using high power lasers. After an introduction to nuclear fission applications of accelerators, this review summarizes some of the scientific developments directed towards this challenging application – with focus on the European HIDIF-study- and outlines parameters of future high energy density experiments after construction of the FAIR/Germany and HIAF/China heavy ion accelerator projects.

[1] Also at Technical University Darmstadt, Schlossgartenstr. 8, 64289 Darmstadt, Germany