

## **ACCELERATOR Driven High Energy Density Science -Perspectives at HIAF (China) and FAIR (Germany)-**

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High Energy Density Physics (HEDP) with intense heavy ion beams is a complementary tool to induce extreme states of matter. The development of this field connects intimately to the advances in accelerator physics and technology. At Xi'An Jiaotong University we are starting a group that will build a low energy, high current ion beam facility for basic beam plasma interaction physics and will make use of existing machines at the Gesellschaft für Schwerionenforschung (GSI-Darmstadt), the Institute of Theoretical and Experimental Physics in Moscow (ITEP-Moscow), and the Institute of Modern Physics (IMP-Lanzhou). In this presentation we will discuss the perspectives of High Energy Density Physics at the facilities under construction and partial operation. These are GSI-FAIR in Germany and the High Intensity Accelerator Facility (HIAF) in China.

High intensity particle accelerators like FAIR at GSI Darmstadt and the proposed HIAF facility in China are a new tools to induce High Energy Density states in matter. We will address a topic that has until now not been investigated in detail but is paramount to the operation of high intensity accelerators as drivers for inertial fusion or high energy density physics experiments. This is the investigation of activation processes of structural components of heavy ion accelerators due to beam loss during operation. This is a crucial issue to optimize the choice of construction materials and maintenance procedures. Significant optimization of the operation schedule can be achieved if the accumulated residual activity is properly controlled and predicted. Radiation may cause changes of the functional properties of the construction materials, which possibly leads to shortening of their lifetime. Replacing of the activated accelerator components is affected by dose-rate restrictions for the "hands-on" maintenance. Handling and final disposal of the accelerator parts after several years of usage is also an important issue directly related to the activation.

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