
BELLA-i a new tool for ion acceleration, rel. plasma physics and applications



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The extension of the world wide unique >1 PW / 1Hz laser facility BELLA into a high intensity user facility will become a game changer in the field of rel. plasma physics, ion acceleration and application ranging from HED research to accelerator physics to nuclear applications.

Reliable experiments at this level with significant statistics have not been able before. For the first time key questions will be answered and theories can be tested experimentally that were inaccessible as the limited shot rate and reproducibility did not provide a conclusive database.

As a few examples the question might be addressed on: 1) Onset of rel. transparency of solid state samples and the change in particle acceleration mechanisms. 2) dependency of ion acceleration on available pulse length and intensity 3) the quest for the 16 year old question on the limit of TNSA driven ion beams and the prospects for Hadron therapy 4) nuclear pump probe experiments in dense plasmas.

We will address some of the questions in more detail to demonstrate the paradigm change in having a high intensity, reliable and high rep rate laser facility available and highlight a few key requirements for the upcoming research.

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