Contribution ID: **40** Type: **Oral presentation**

Medium-pulse length source studies for the European Spallation Source

A compression of the 5 MW ESS proton pulse from the present 2.86 milliseconds to a medium pulse length of a few tens of microseconds which is better matched to the moderator time-constant of thermal and cold neutrons would considerably boost the performance for many instruments at ESS. A pulse of a few tens of microseconds can most likely be handled by the ESS target with some minor modifications to the tungsten block shape while a short pulse of a microsecond could not be managed. Generating such a proton pulse with preserved integrated beam power per pulse requires a storage ring to be added to the ESS accelerator. Such a ring has been studied within the ESSnuSB neutrino super-beam study. Historically, the extraction of a medium pulse from a storage ring for high-power beams have been considered impossible as traditional slow extraction schemes require a septum in the ring which quickly would be destroyed at high-beam powers. However, there are new ideas for how to generate such a medium-pulse length without intercepting extraction devices based on advances in longitudinal and transverse beam manipulations techniques. We will in this talk give an overview of the proposed scheme but also discuss the pros and cons for the accelerator, the target, moderators and instruments of a medium pulse length compared with traditional short pulse sources.

Primary authors: Prof. MASATOSHI, Arai (European Spallation Source ERIC); PRIOR, Christopher (STFC); ESHRAQI, Mamad (E); LINDROOS, Mats (European Spallation Source ERIC); Mr JONES, Bryan (European Spallation Source ERIC); Dr PLOSTINAR, Ciprian (European Spallation Source ERIC); Dr CARLILE, Colin (European Spallation Source ERIC); Prof. TORD, Ekelöf (Uppsala University); Dr DANARED, Hakan (European Spallation Source ERIC); Dr ZANINI, Luca (European Spallation Source ERIC); Dr OLVEGÅRD, Maja (Uppsala University); Dr RYOICHI, Miyamoto (European Spallation Source ERIC); Dr MILAS, Natalia (European Spallation Source ERIC); Dr DEEN, Pascale (European Spallation Source ERIC); Prof. WERNER, Schweika (European Spallation Source ERIC); Prof. MACHIDA, Shinji (STFC UKRI); Mr ODEN, Ulf (European Spallation Source ERIC); Dr SANTORO, Valentina (University of Lund)

Presenter: Dr PLOSTINAR, Ciprian (European Spallation Source ERIC)

Session Classification: Accelerator