

CELSIUS as an η Factory, C. EKSTRÖM, D. REISTAD, The Svedberg Laboratory; H. CALEN, S. KULLANDER, Department of Radiation Sciences, Uppsala University, Uppsala, Sweden - The CELSIUS ion storage ring at the The Svedberg Laboratory is in operation since 1989 for light- and heavy ion nuclear-physics experiments in the intermediate-energy region. High-precision experiments on rare decays of light mesons are currently prepared within the WASA project - a high-luminosity experiment using a close to 4π detector configuration. A crucial component in the project is a novel internal-target system producing a stream of frozen hydrogen micro-spheres (pellets). With an effective target thickness of 5×10^{15} atoms/cm² and with 10^{10} protons in the ring, the luminosity will be of the order 10^{32} cm⁻²s⁻¹. The cross section for η production for 1.36 GeV protons is 5 mb, giving a production rate of 30 million η mesons per day at 75% duty cycle. The CELSIUS ring with the pellet target system will thus serve as an efficient η factory. A positive outcome of the development of deuterium pellets will increase the production rate about a factor of 5, and in the case of the $pd \rightarrow {}^3\text{He}\eta$ reaction close to threshold give a clean tagging of the η production.