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Technological features and status of the new heavy ions synchrotron SIS100 at FAIR

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SIS100 is a new superconducting heavy ion synchrotron optimized for the acceleration of high intensity heavy ion beams. Most crucial intensity limitation for heavy ion beams in SIS100 is the dynamic vacuum and corresponding beam loss by projectile ionization. Ionization loss and ion induced desorption drive the residual gas pressure into an instability, generating an intensity barrier at much lower intensity levels than any space charge limit. Technologies for stabilizing the dynamic vacuum, such as extensive charge separator lattice, pumping by cryogenic magnet chambers, cryo-adsorption pumps and cryo-ion catchers had to be implemented. SIS100 will also be the first user synchrotron comprising a laser cooling system for cooling at relativistic beam energies. Combined with a strong bunch compression system, laser cooling will support the generation of short ion bunches. Meanwhile, a large amount of the SIS100 components have been delivered and preparations for installation are launched. The shell construction of SIS100 underground tunnel is completed. Installation of the technical building infrastructure and the cryogenic distribution system are ongoing.

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Footnotes

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