

The High-Brilliance Neutron Source (HBS-I)

33rd LINAC – 2026 – Daejeon, Korea



HOLGER PODLECH

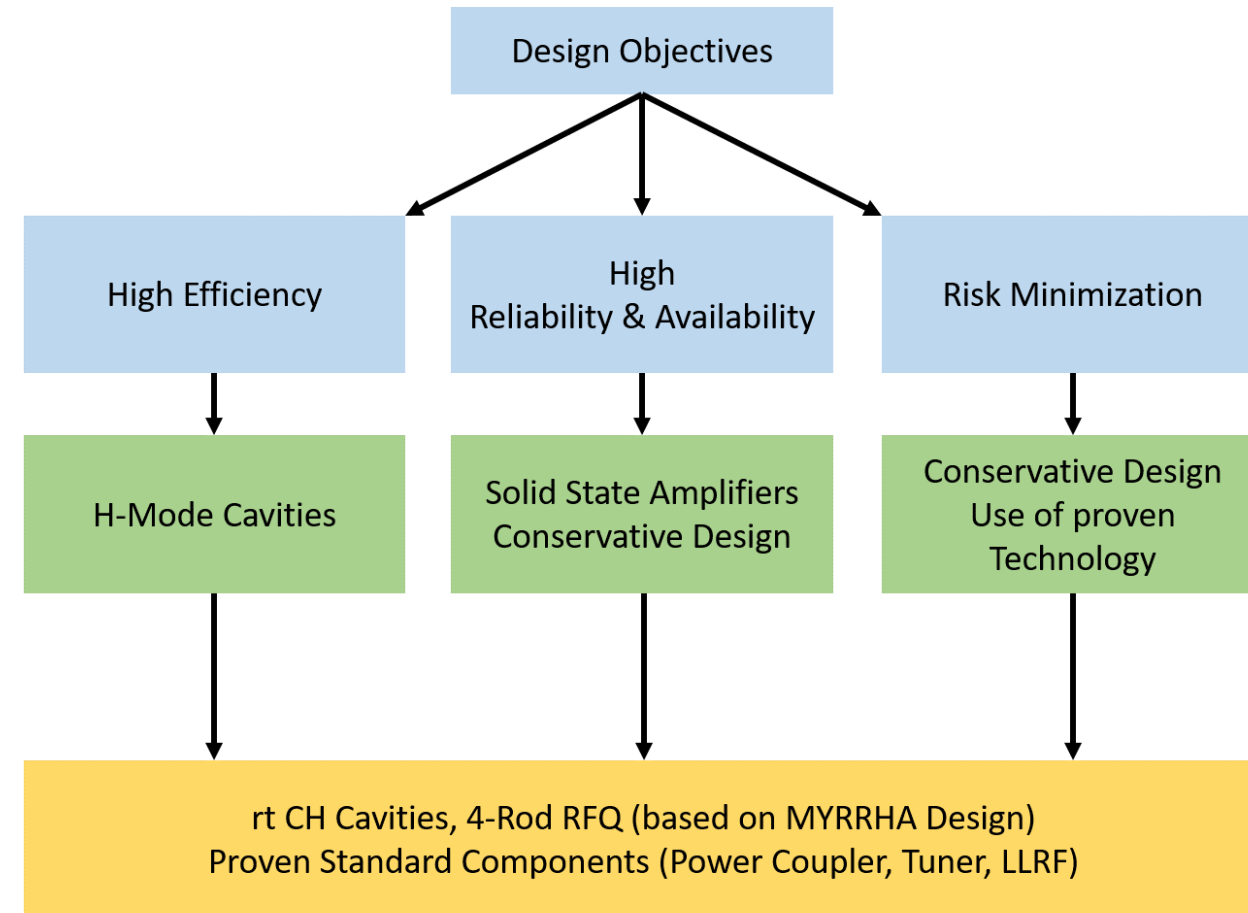
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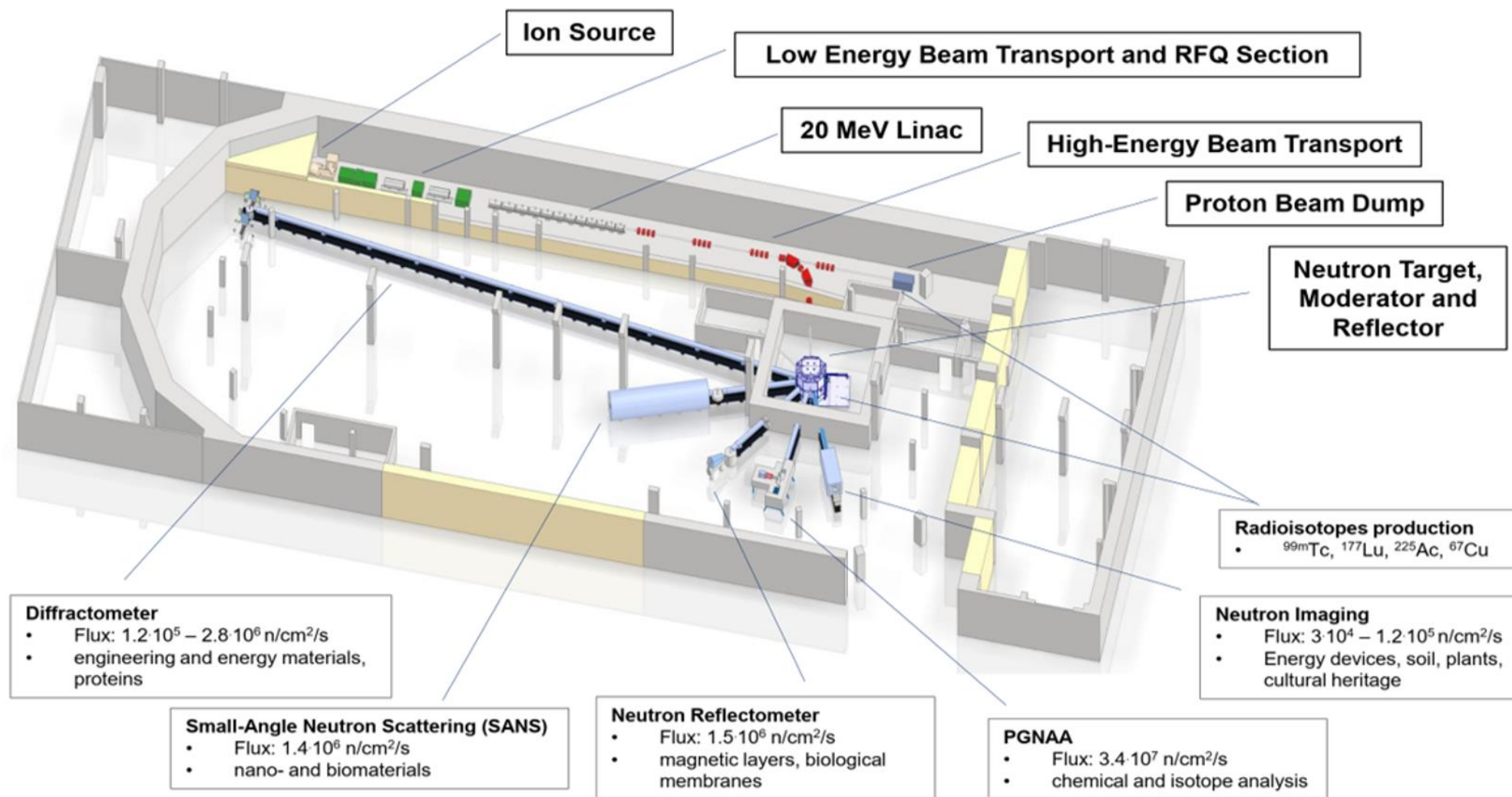
High-Brilliance Neutron Source HBS-I

- HBS belongs to the class of **High Current Accelerator based Neutron Sources (HiCANS)**
- Neutrons are created via nuclear reactions with low energy protons hitting a specific target (Be, Va, Ta)
- Neutron fluxes at the experiments are comparable with spallation sources and reactors.

Parameter	Value	Unit
Particles	Protons	N/A
Energy	20 (30)	MeV
Beam current	100	mA
Frequency	176.1	MHz
Peak beam power	2 (3)	MW
Maximum duty factor	25	%
Max. average beam power	500 (750)	kW
Pulse length	208 & 833 (up to 2000)	μs



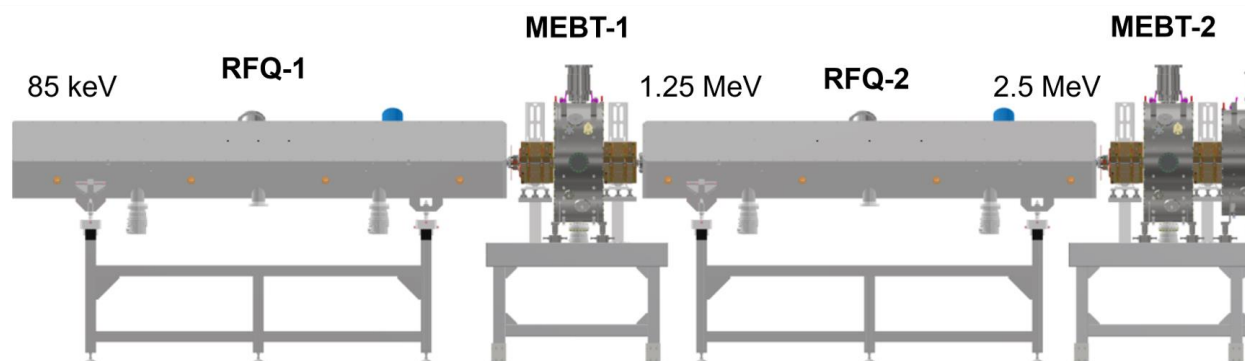
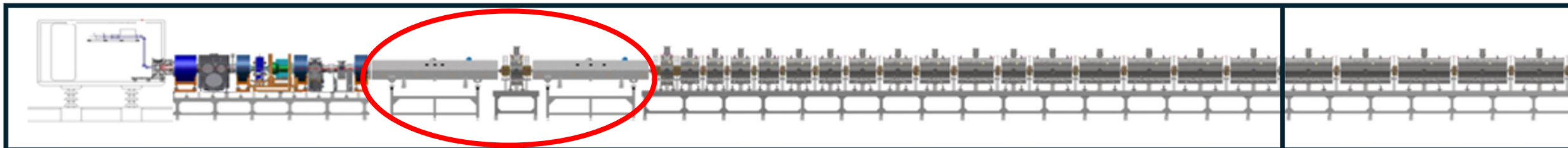
General Layout of HBS-I at Research Center Jülich



HBS-I RFQ

20 MeV

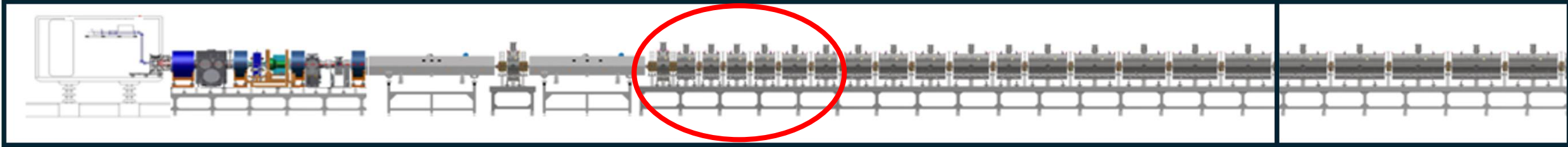
30 MeV



Parameter	RFQ-1	RFQ-2	Unit
Input energy	0.085	1.25	MeV
Output Energy	1.25	2.5	MeV
Electrode voltage	85	85	kV
Shunt impedance	73	73	k Ω m
Length	3.6	3.3	M
Peak RF losses	360	330	kW
Heat load (25% df)	25	25	kW/m
Peak RF power with beam	480	455	kW
Transmission (sim)	99.8	98.6	%

MYRRHA RFQ

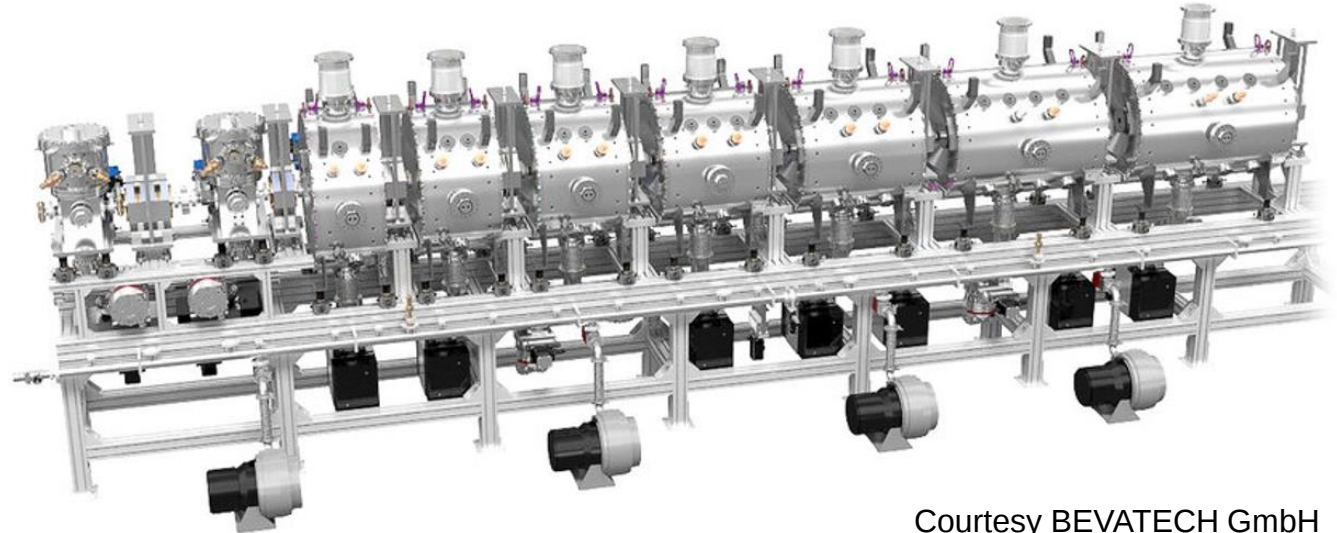
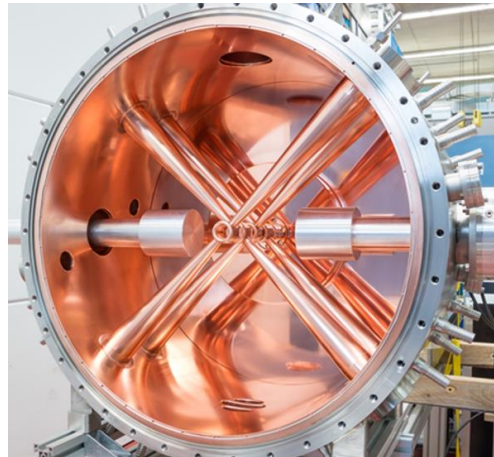
HBS-I CH-DTL



Main Linac based on independently phased CH-cavities (room temperature) based on MYRRHA-Design

Crossbar H-Mode cavities (CH)

- High shunt impedance
- Mechanical rigidity
- Excellent cooling



Courtesy BEVATECH GmbH
bevatech.com

Summary and Outlook

- ✔ *The HBS-I Linac will be a state-of-the-Art high power proton Linac*
- ✔ *In March 2026, the German Science and Humanities Council officially recommended the prompt implementation of the High Brilliance Neutron Source – Phase I (HBS-I)*
- ✔ *Official project start is expected mid of 2027*