Review of LHC Heat Loads and Upgraded Cryogenic System

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Heat Load Dependence w/r to Beam Parameters

<table>
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<th>Beam Parameters for Different LHC Upgrade Scenarios</th>
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<td>Specific Heat Loads for the Different LHC Scenarios</td>
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Conclusions & R&D Requirements:
- Cold mass cooling: R&D is required for heat extraction above 10 W/m
- Beam screen cooling: additional studies on temperature profiles in the B5 wall and in interconnection regions are needed.
- By adding and/or upgrading cryoplants, cryogenics can cover the different upgrade scenarios but additional space at the surface and underground level has to be found for architecture scheme 2.
- Scenarios with super-bunch beams are more interesting for cryogenics.