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CEA COUPLER ACTIVITY UPDATE

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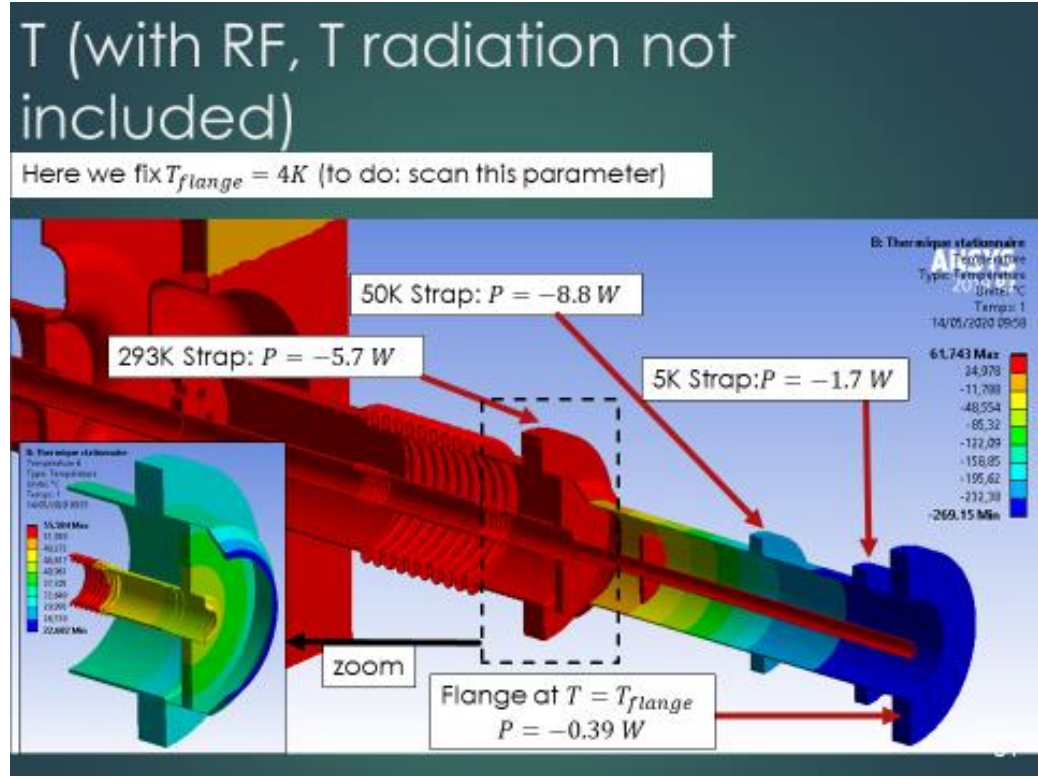
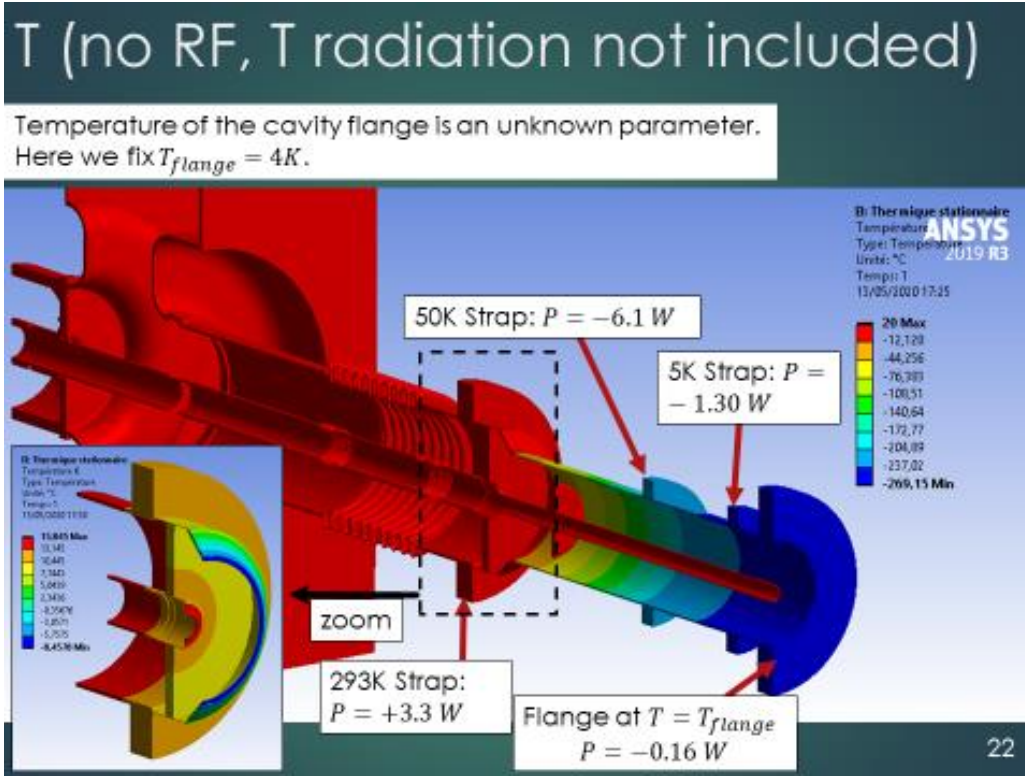
PIP-II Coupler collaboration meeting

Calculation phase: Cryomodule configuration



- Our approach:
 - Use of 3D HFSS/Ansys and 2D Comsol thermal/RF coupled calculation models
 - The 2D model will allow to make rapid calculations to orientate the choices for the parametric studies or the assumptions. Afterword, the calculations can be performed using the 3D and 2D models and results compared.
- We have very good consistencies between the two models results
- Current calculations:
 - Static thermal calculations
 - Coupled RF & thermal calculations
 - Examples of calculation are given in the flowing slides: model, assumptions and results need to be discussed in a dedicated meeting.

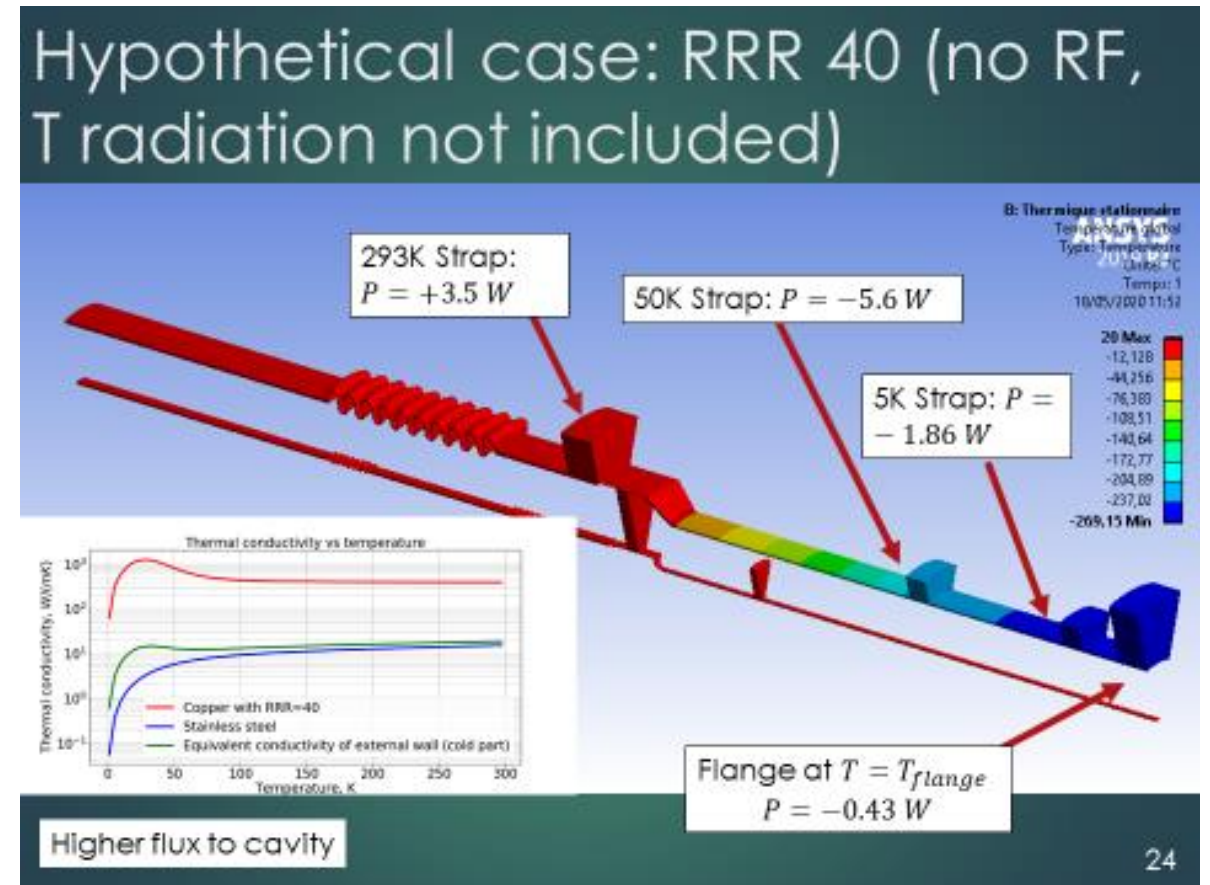
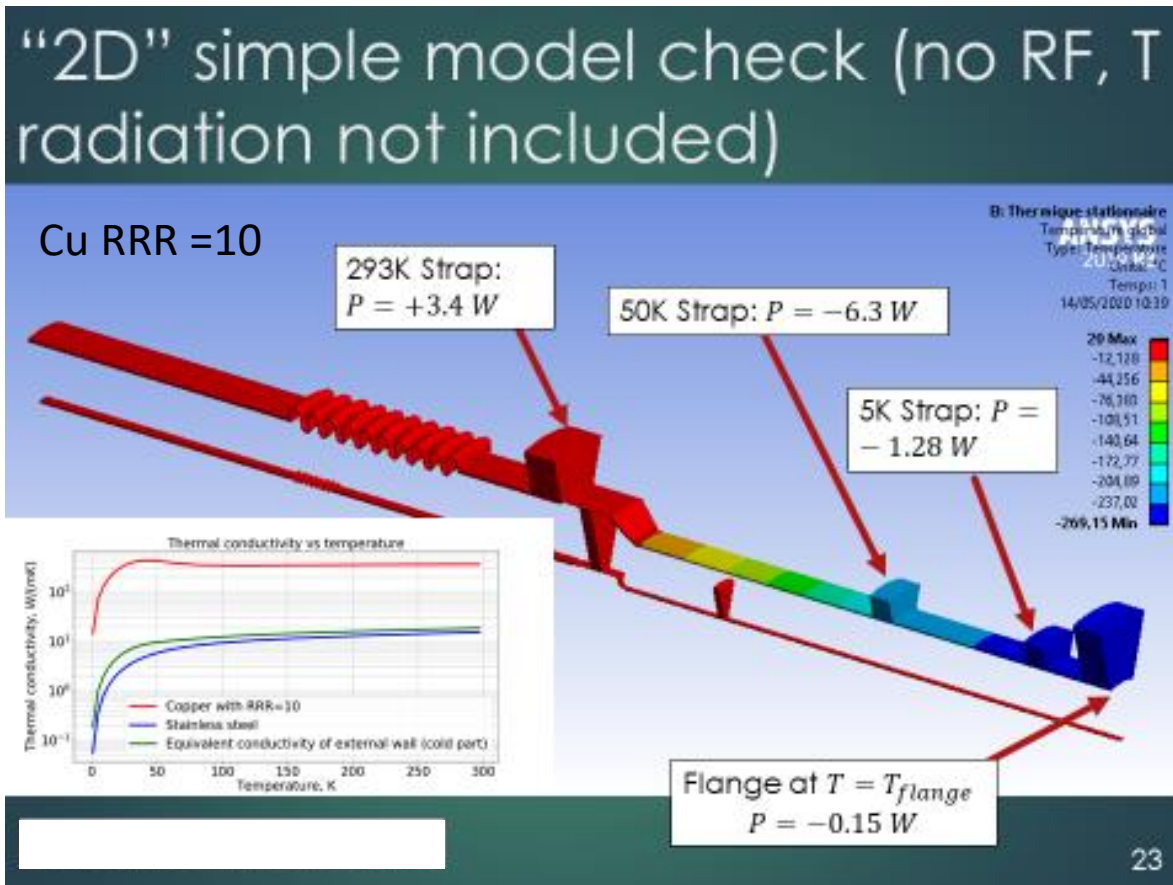
Static vs total losses



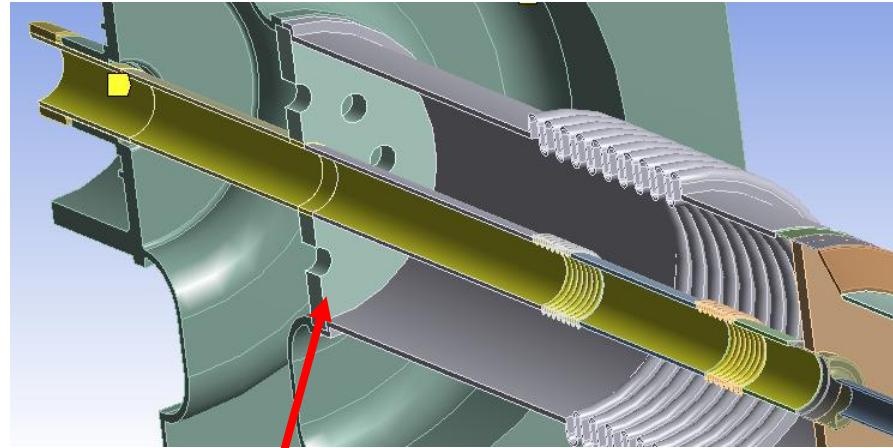
- ❑ Thermal Radiation first estimation is made and added to the heat flux balance (not presented here)
- ❑ The impact of the losses in the Al gasket and coupler to cavity flange surface will be added to the model and studied for copper plated and not copper plated flange surface cases.
- ❑ Calculation results were compared to Fermilab's and there are some differences that could be explained by models and assumptions differences.

Impact of copper plating noncompliance

- The aim is to estimate the impact of copper plating noncompliances on the coupler behavior.
- We started with the calculation of the impact of a high RRR copper plating (40 instead of 10) in the static mode. Results are not discussed here. More calculation need to be performed for a more complete study before analysis



Last subjects discussed with Fermilab



Teflon support

- ❑ The use of Teflon support at the connection between the power coupler coaxial part and the waveguide will depend of the X-ray radiation amount during operation because of the low radiation resistivity of this material. The use of PEEK material as alternative is rejected for thermal considerations. S. Kazakov proposed a metallic ring alternative allowing an equivalent RF matching.
- ❑ A list of the hardware needed for the use of the IKR060 gauge on power couplers was communicated to Fermilab, for information.