

ColMat

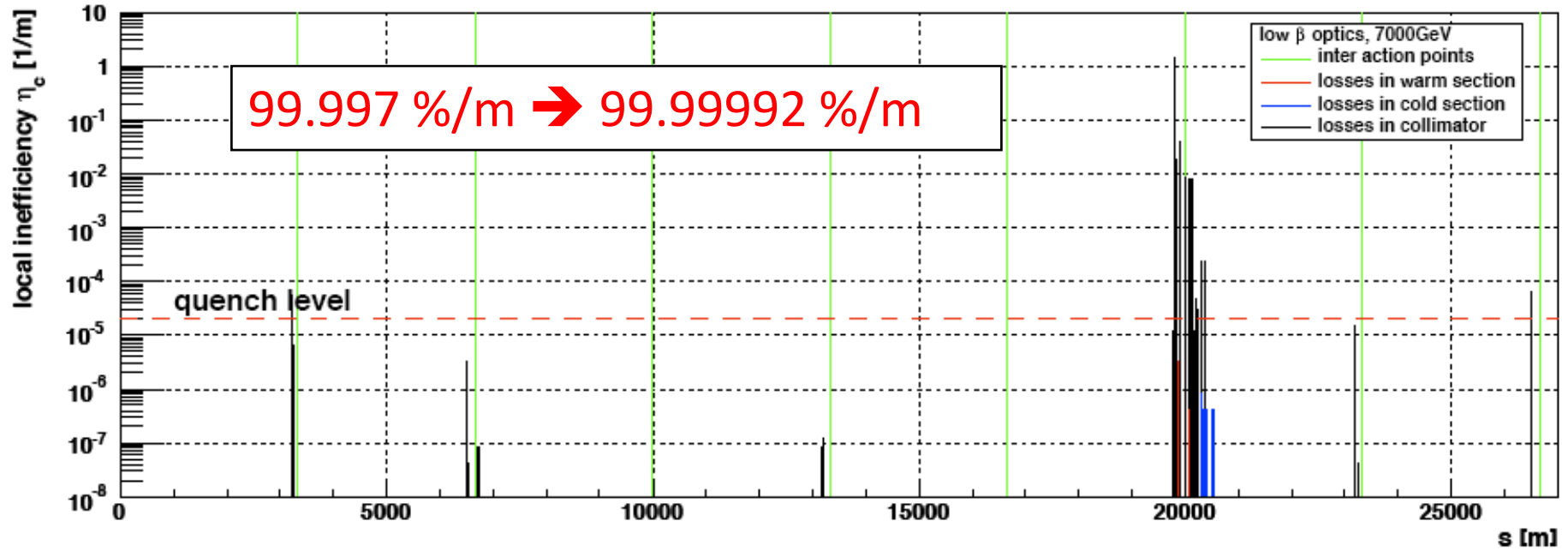
Simulations CERN

Ralph W. Aßmann

Kick off Meeting of EuCARD/ColMat
CERN – June 17th, 2009

- *Task 2. Modelling, Materials, Tests for Hadron Beams.*
 - **Sub-task 1: Halo studies and beam modelling.**
 - Nature, magnitude and location of **beam losses** in modern accelerators.
 - Dynamics of the beam **halo** and proper **diffusion** models.
 - Design and optimization of **multi-stage collimation** systems.
 - Simulation of **multi-turn collimation processes**, including nuclear interactions of halo particles in the collimator materials and bent crystals.

T. Weiler & R. Assmann



Inefficiency reduces by factor 30 with innovative cryogenic collimators.

Caution: Further studies must show real feasibility of this proposal (energy deposition, heat load, integration, cryogenics, beam2, ...). Just a concept at this point.

Cryogenic collimators for LHC studied with GSI (\rightarrow FAIR).

- *Task 2. Modelling, Materials, Tests for Hadron Beams.*
 - **Sub-task 2: Energy deposition calculations and tests.**
 - **Showering models** with protons and ions in the relevant energy range.
 - Modelling of the accelerator **geometry** and **materials**.
 - **Energy deposition** calculations for various operational assumptions.
 - Calculation of **residual dose rates**.
 - Modelling **radiation-induced displacements per atom** (dpa).

CERN/TE

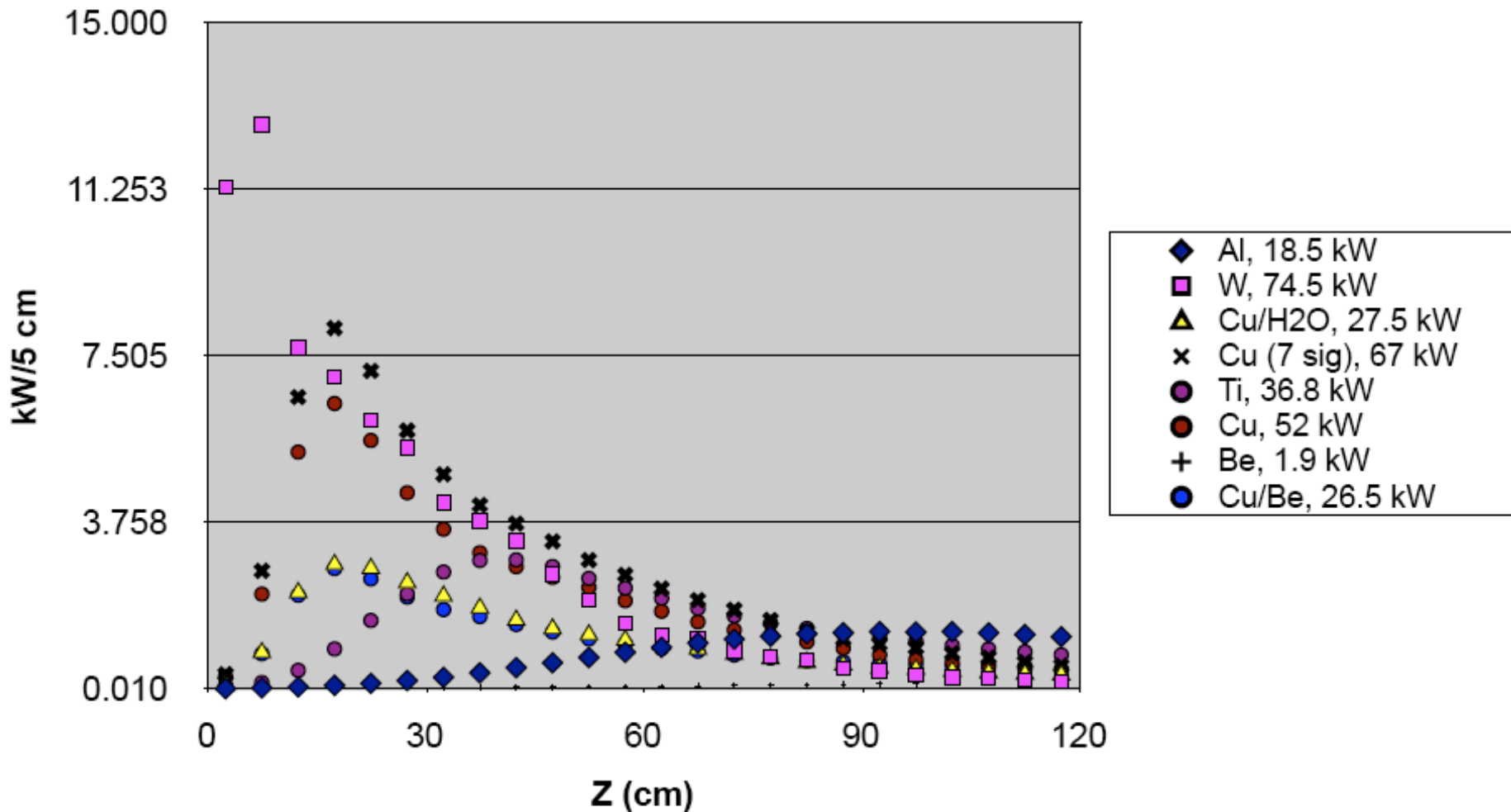


FLUKA Results - Power Deposited vs. Length

1st secondary collimator
Various materials



TCSM.A6L7 Upper Right Jaw vs. Length 80% halo on TCPV, 5% halo on TCSM.A6L7



- Present status was summarized in April 2009 during the **conceptual design review for phase II of LHC collimation**. All talks and info available at:

<http://indico.cern.ch/conferenceDisplay.py?confId=55195>

- You also find the **report of the review committee**:

<http://indico.cern.ch/getFile.py/access?resId=0&materialId=0&confId=55195>

- Please use this as reference...
- Building on this, extending it and putting the technical details, we will work out the specifications, due in 1 and 2 years.