Moderated Discussions on Hot Topics:

Topic 3: Spoke vs Elliptical Cavities for Beta = 0.5

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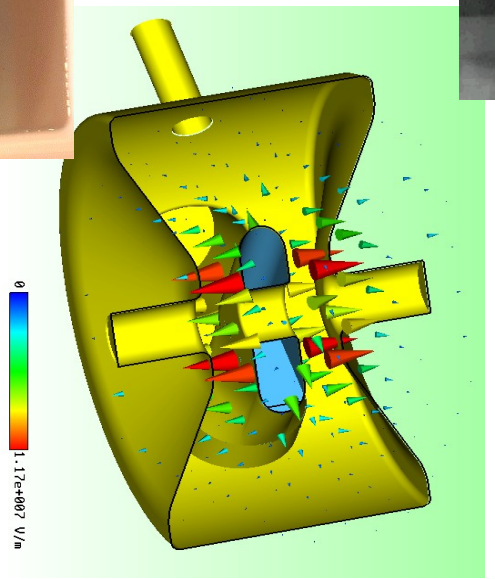
Wednesday, July 13, 2005

History

β

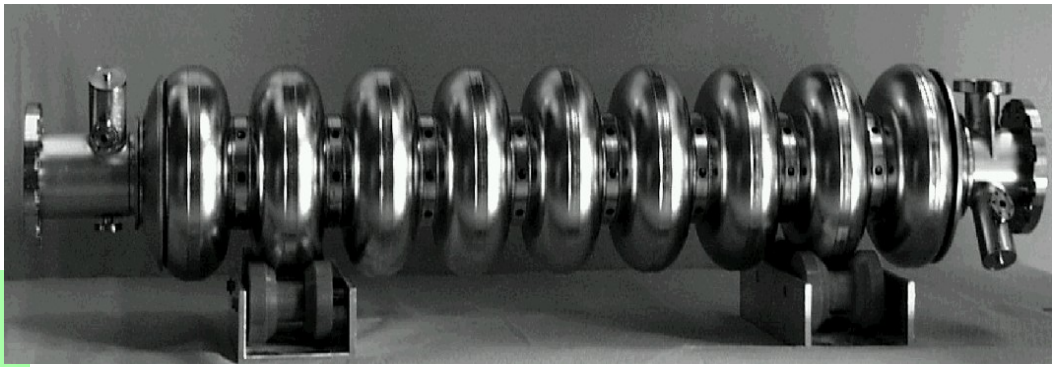
Spoke Resonators
(or other half-wave resonators)

- β-range: 0.15 – 0.4
- protons, ions
- few gaps

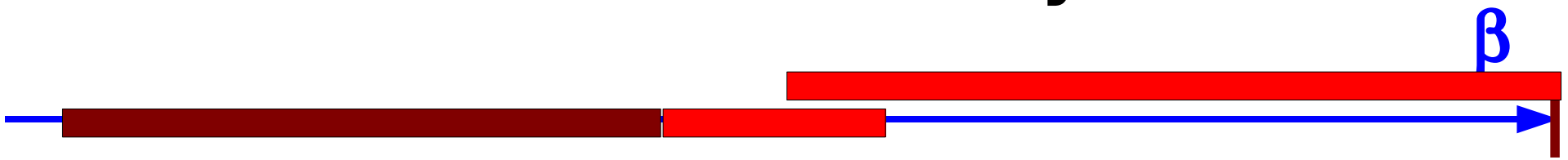


Elliptical Resonators

- β-range: 1.0
- electrons
- many gaps



Recent History

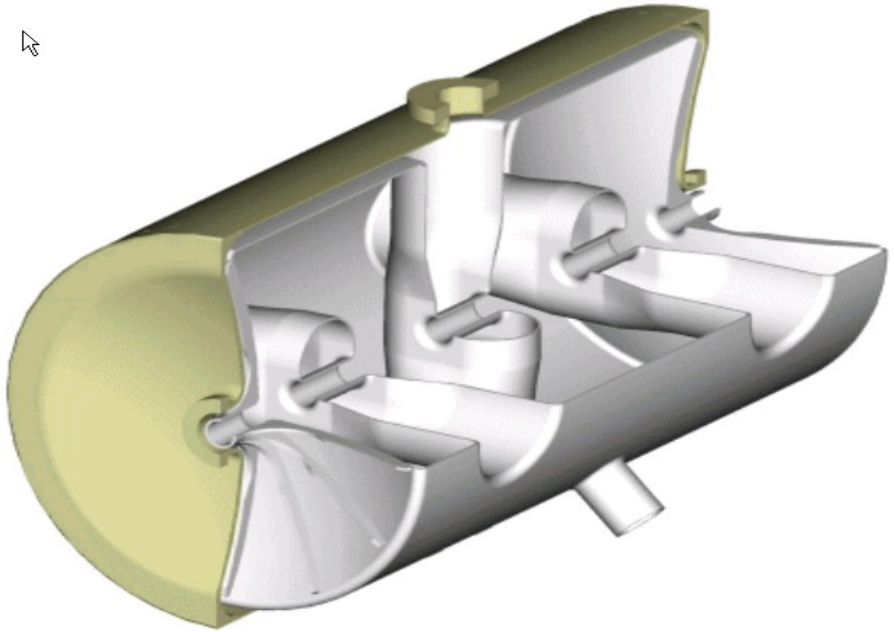


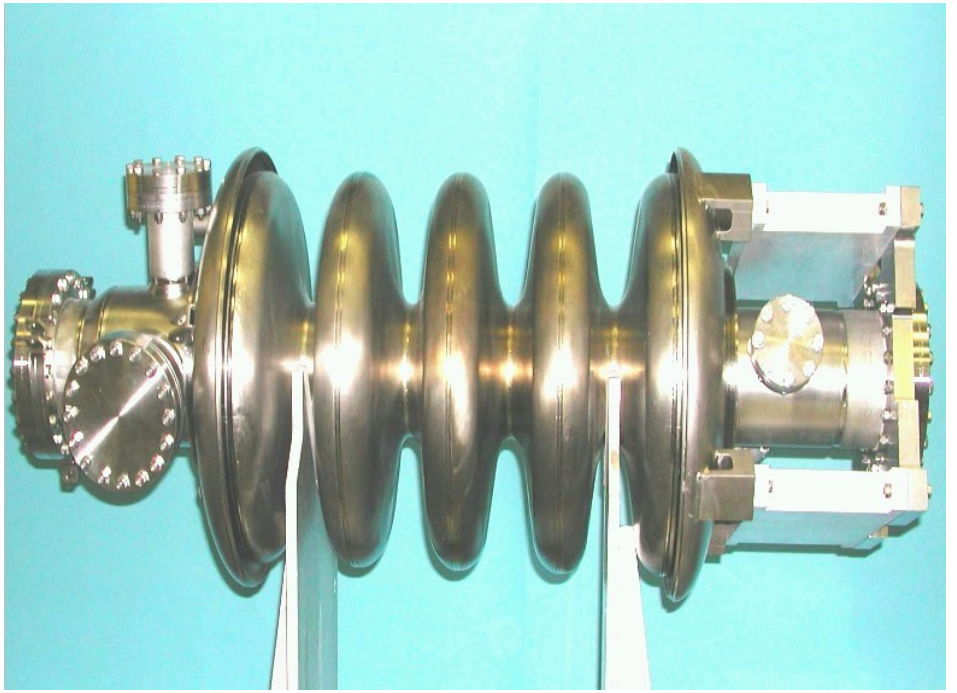
Spoke Resonators

- β-range: 0.15 – 0.65
- protons, ions
- Moderate no. of gaps

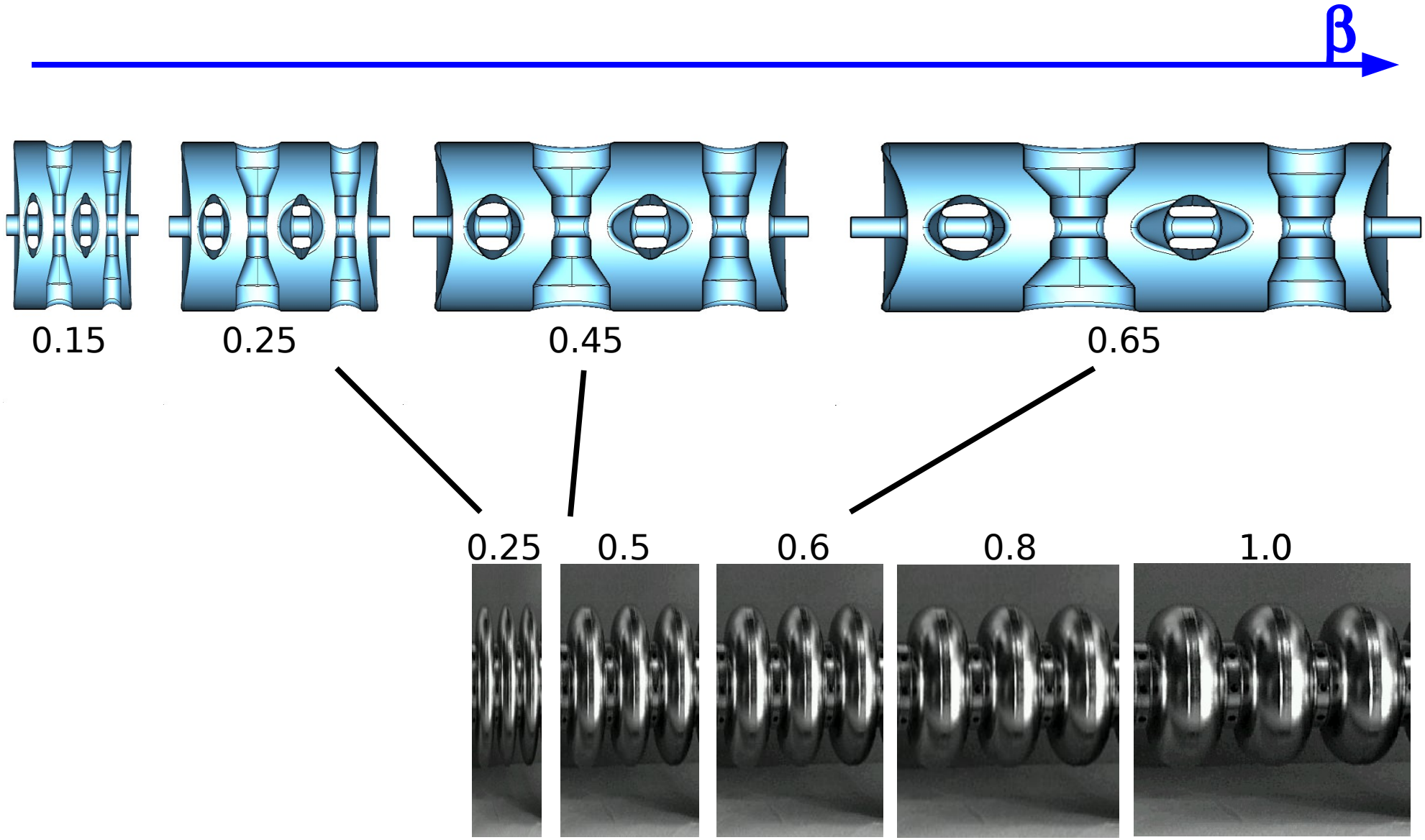
Elliptical Resonators

- β-range: 0.5 - 1.0
- electrons, protons, ions
- moderate no. of gaps





Geometric Limitations



Scope of the Discussion

- Is one of the two technologies more advantageous than the other in the transition region around β=0.5 ?
- Are the two approaches equivalent?
- Or is the best technology dependent on the specific application?

Without real operational experience the evaluation will have to be based on results of simulations and low power tests.

To start the discussion Ken Shepard, ANL (for spoke resonators) and Terry Grimm, MSU (for elliptical resonators) agreed to provide a 5 minute introduction into the advantages of each technology.

Parameters/Properties to Discuss

In no specific order (and probably not a complete list):

- RF-performance
- Fabrication
- Surface treatment/cleaning
- Mechanical properties
- Choice of frequency
- Choice of operation temperature
- Beam-cavity interaction