Bucked Coils
- Realistic VS Non-Realistic Beam -

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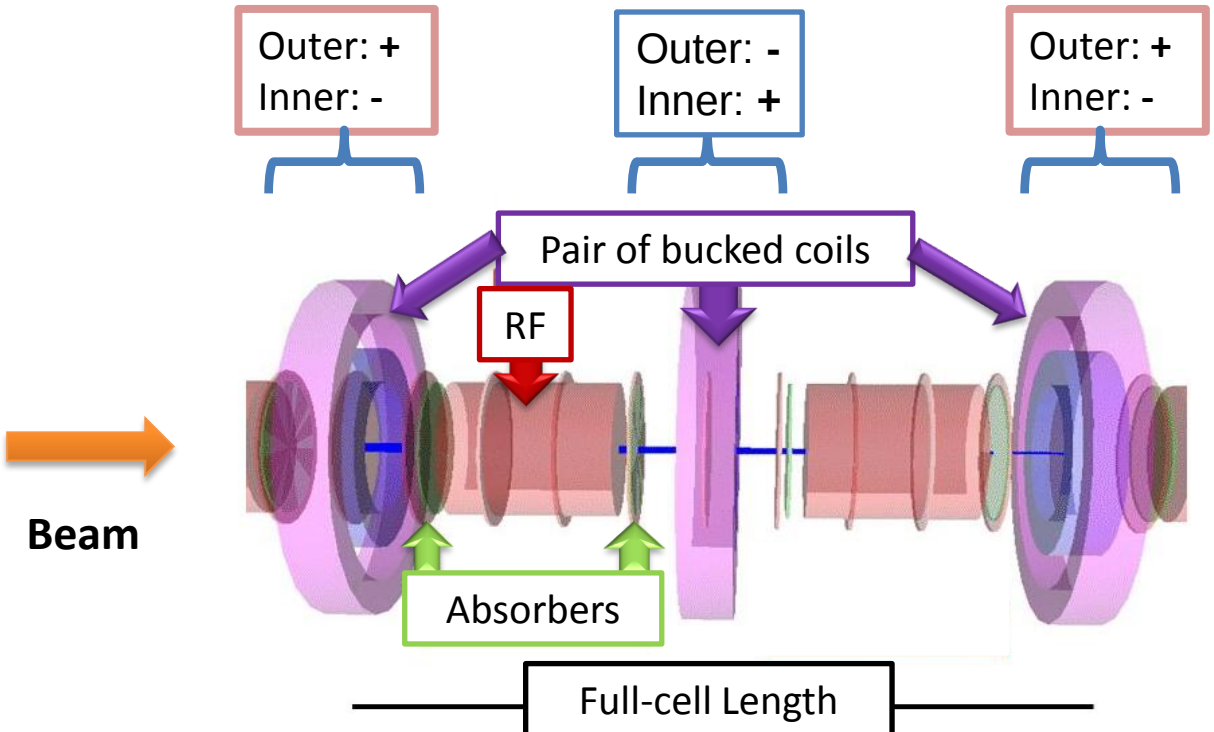
Bucked Coils, BC

- Trying to decrease the magnetic field at the position of the RF cavities
- BC configuration: A pair of bucked coils, followed by an RF cavity which has a LiH absorber on each side. Every pair of coils has opposite polarity than the previous pair

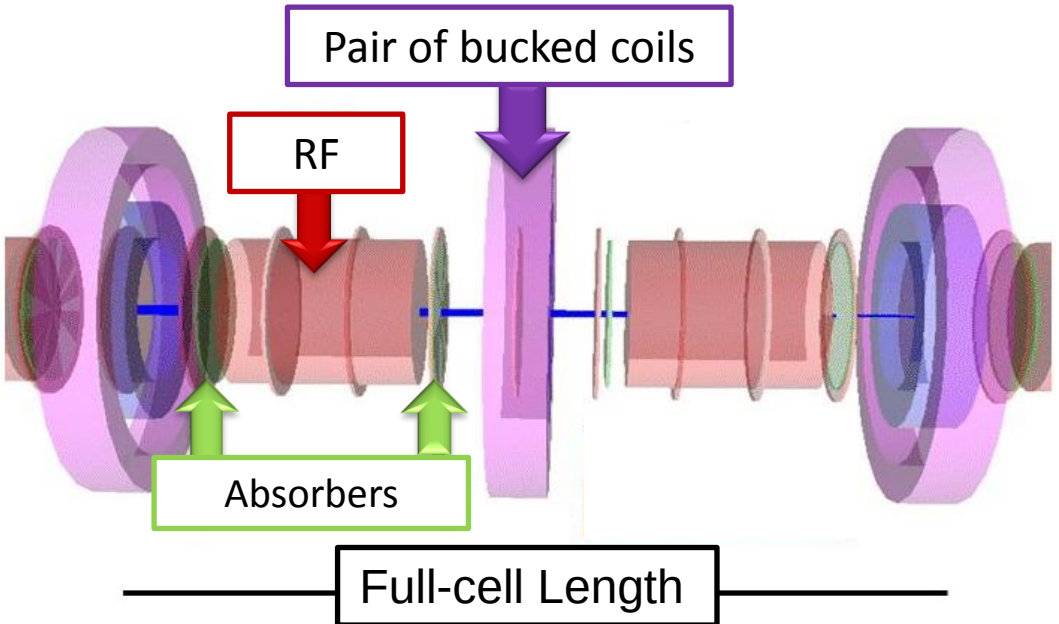


Bucked Coils, BC

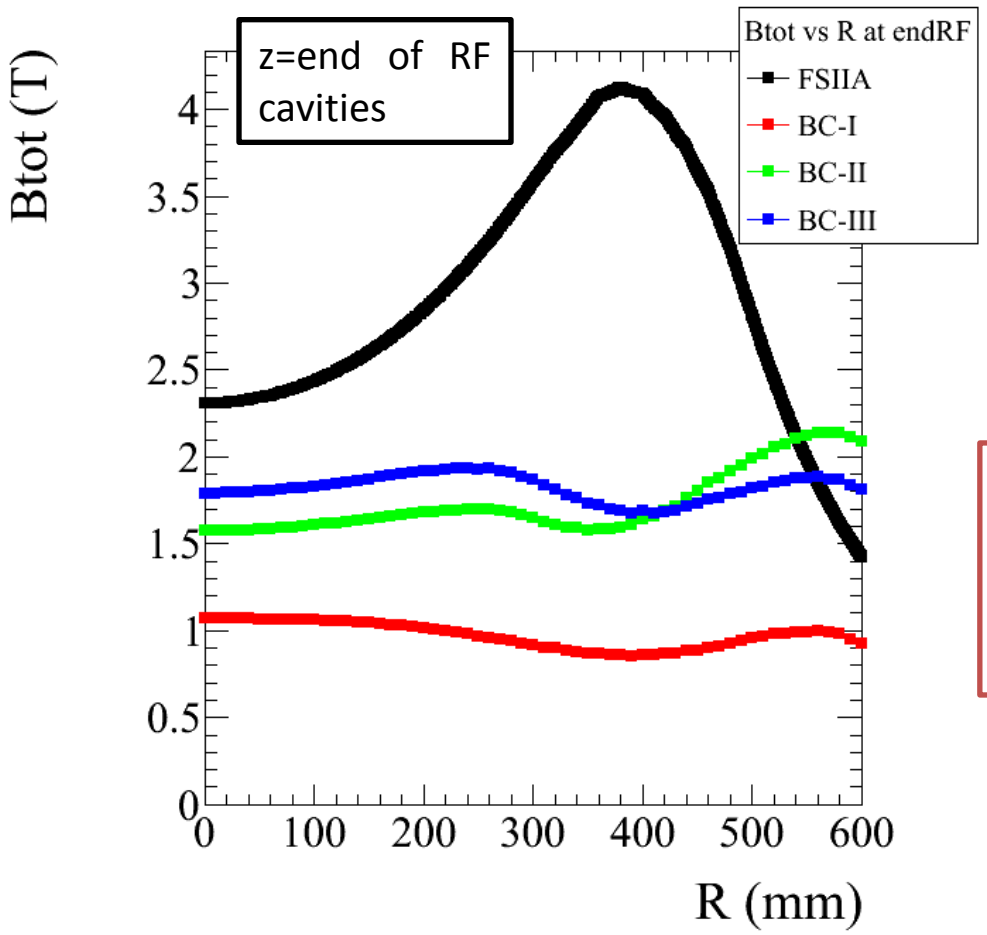
Three different versions of BC were studied, BC-I, BC-II, BC-III.
They **all have the SAME configuration except for**:
- the cell's length and
- the current densities of their coils

Differences of the BC versions

Lattice	BC-I	BC-II	BC-III
Full-cell Length (m)	2.10	1.80	1.80
Inner Coil Current Density (A/mm²)	90.24	128.10	99.26
Outer Coil Current Density (A/mm²)	120.00	112.80	132.00



Magnetic Field Comparison



Black: FSIIA

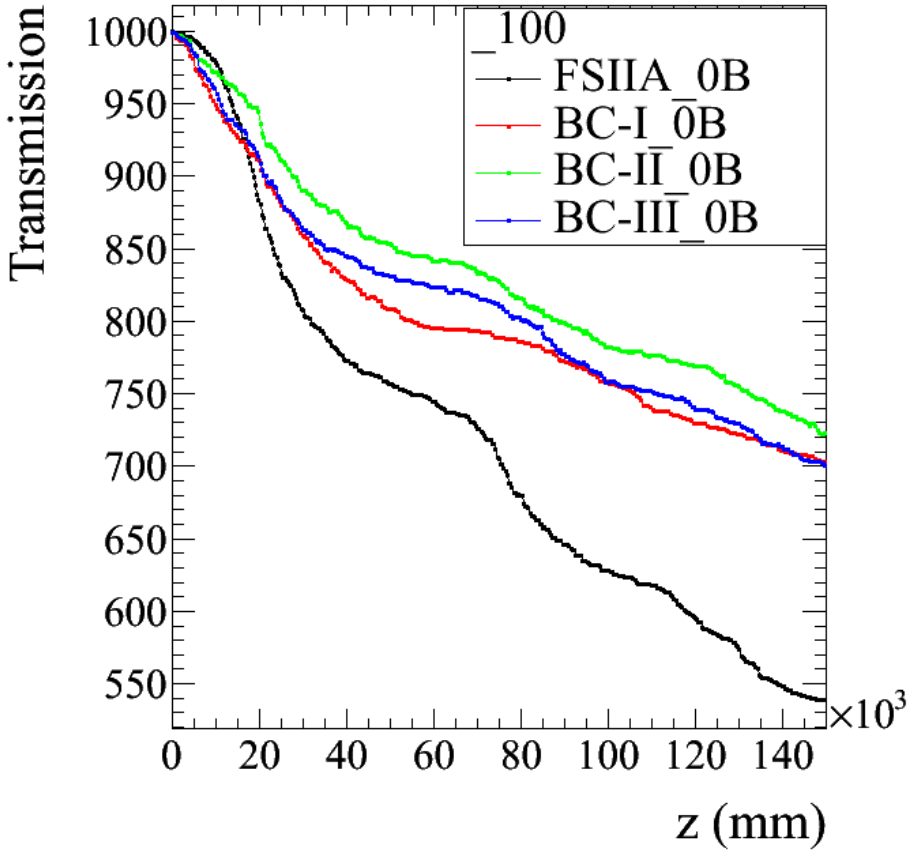
Red: BC-I

Green: BC-II

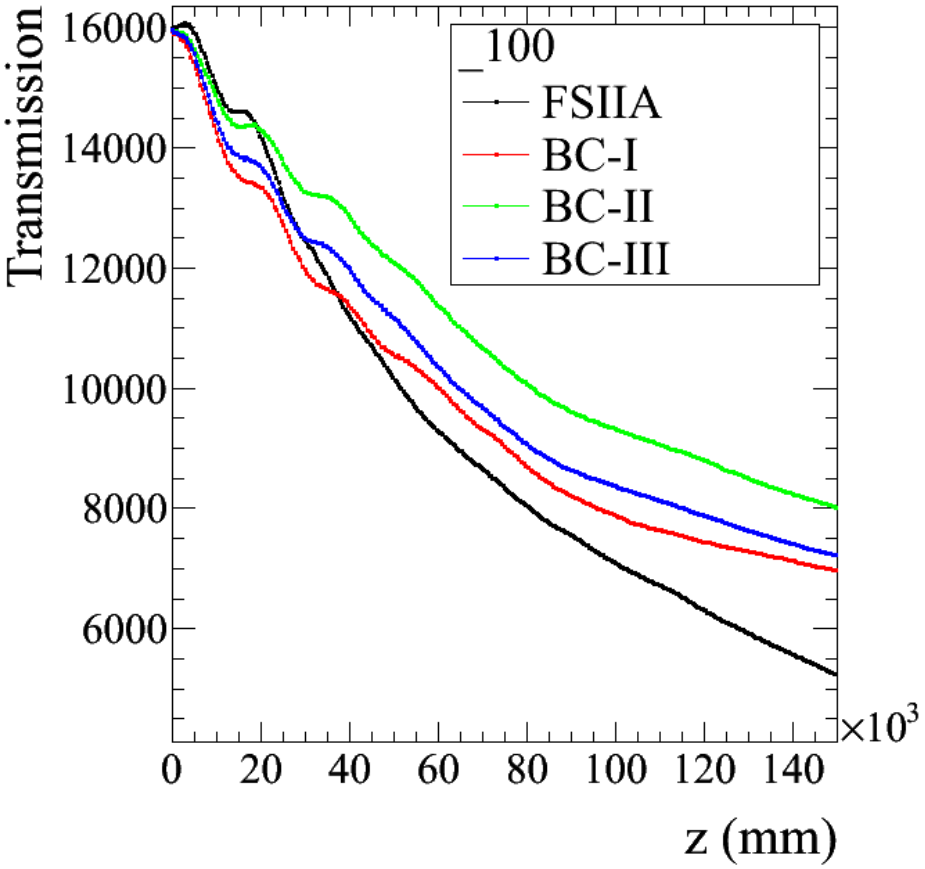
Blue: BC-III

- **FSIIA: >4 T**
- **BC-I: 4 times lower than FSIIA**
- **BC-II and BC-III: 2 times lower than FSIIA**

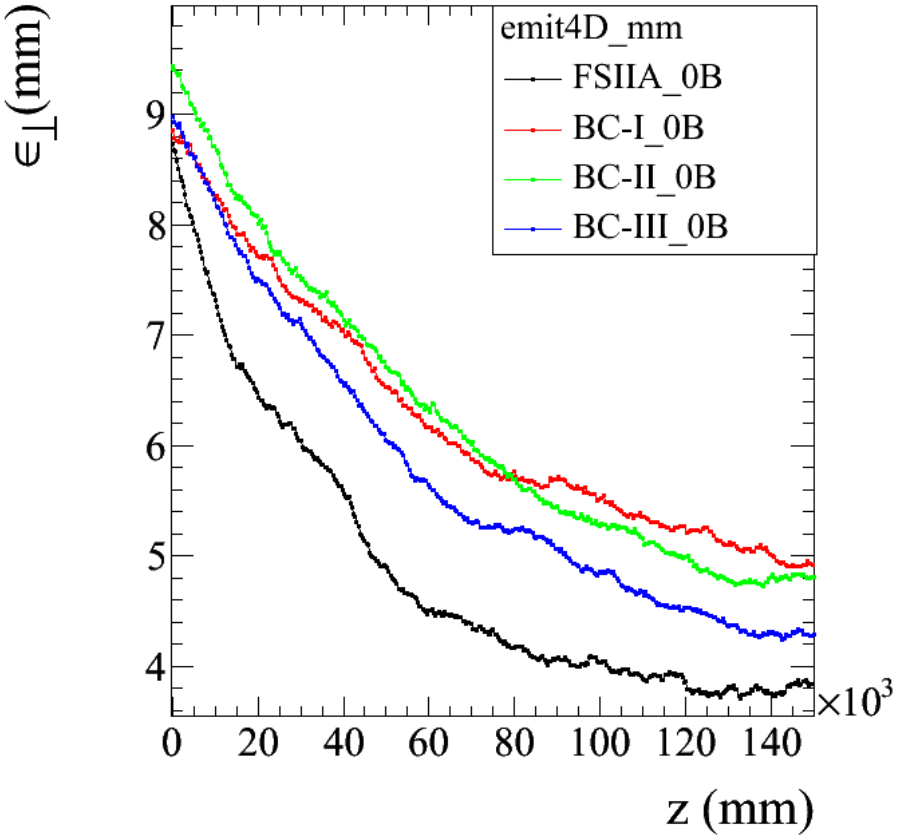
Non-realistic Beam



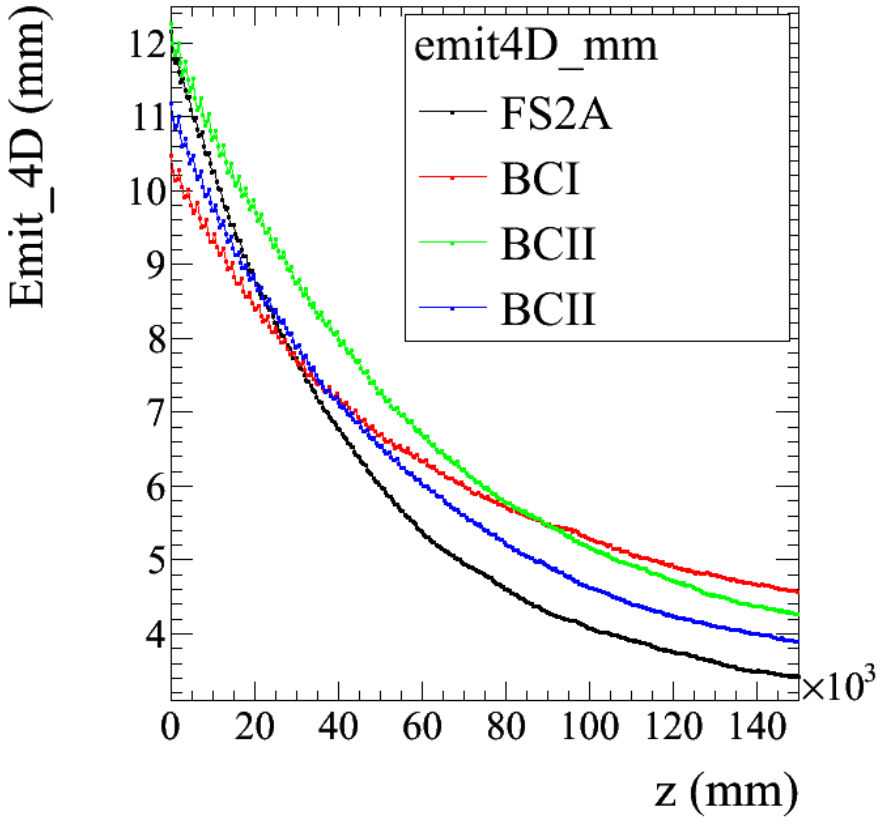
Realistic Beam



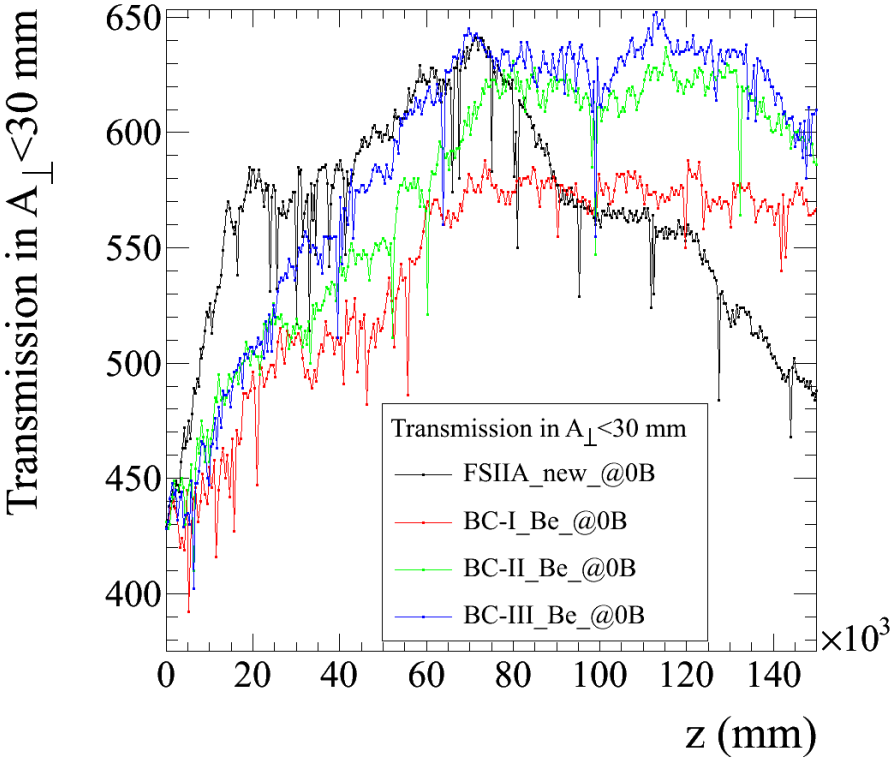
Non-realistic Beam



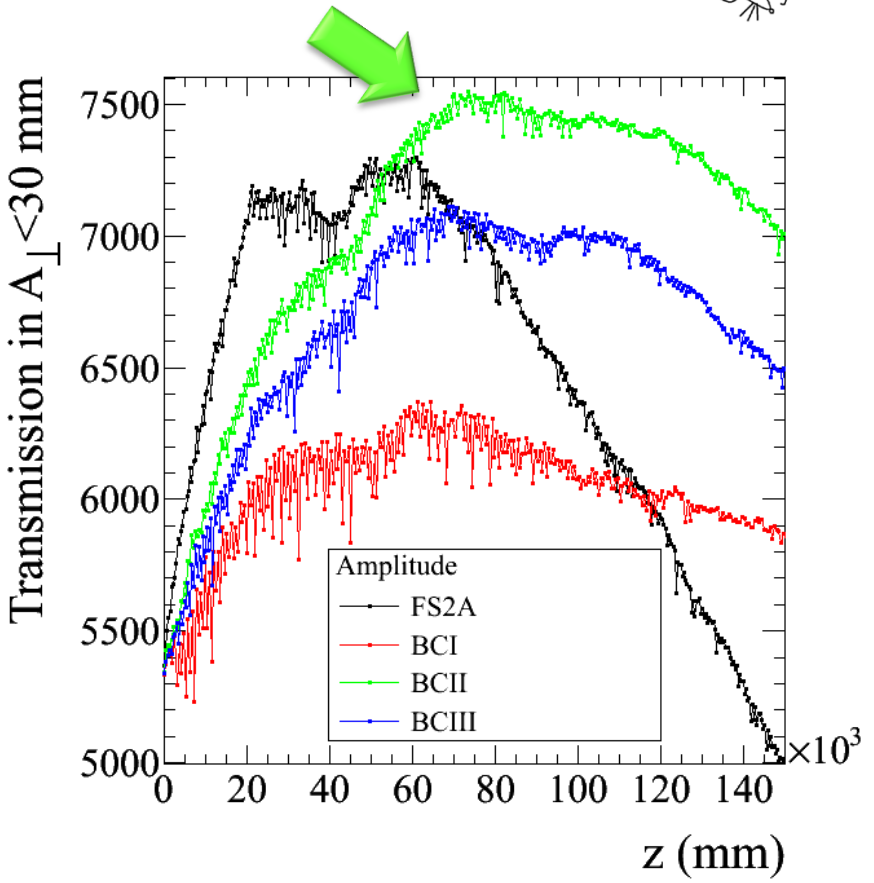
Realistic Beam



Non-realistic Beam



Realistic Beam



Conclusions

- Decrease in Magnetic Field wrt FSIIA:
  - **4 times with BC-I**
  - **2 times with BC-II and BC-III**
- Transmission within 30 mm A_T wrt FSIIA
  - Non-realistic beam:
    - BC-I 6% less transmission
    - BC-II and BC-III ~same as FSIIA
  - **Realistic Beam:**
    - **BC-II best transmission**

Future work

- Keep working/trying to improve Bucked Coils more
- Focus on 6D-cooling