

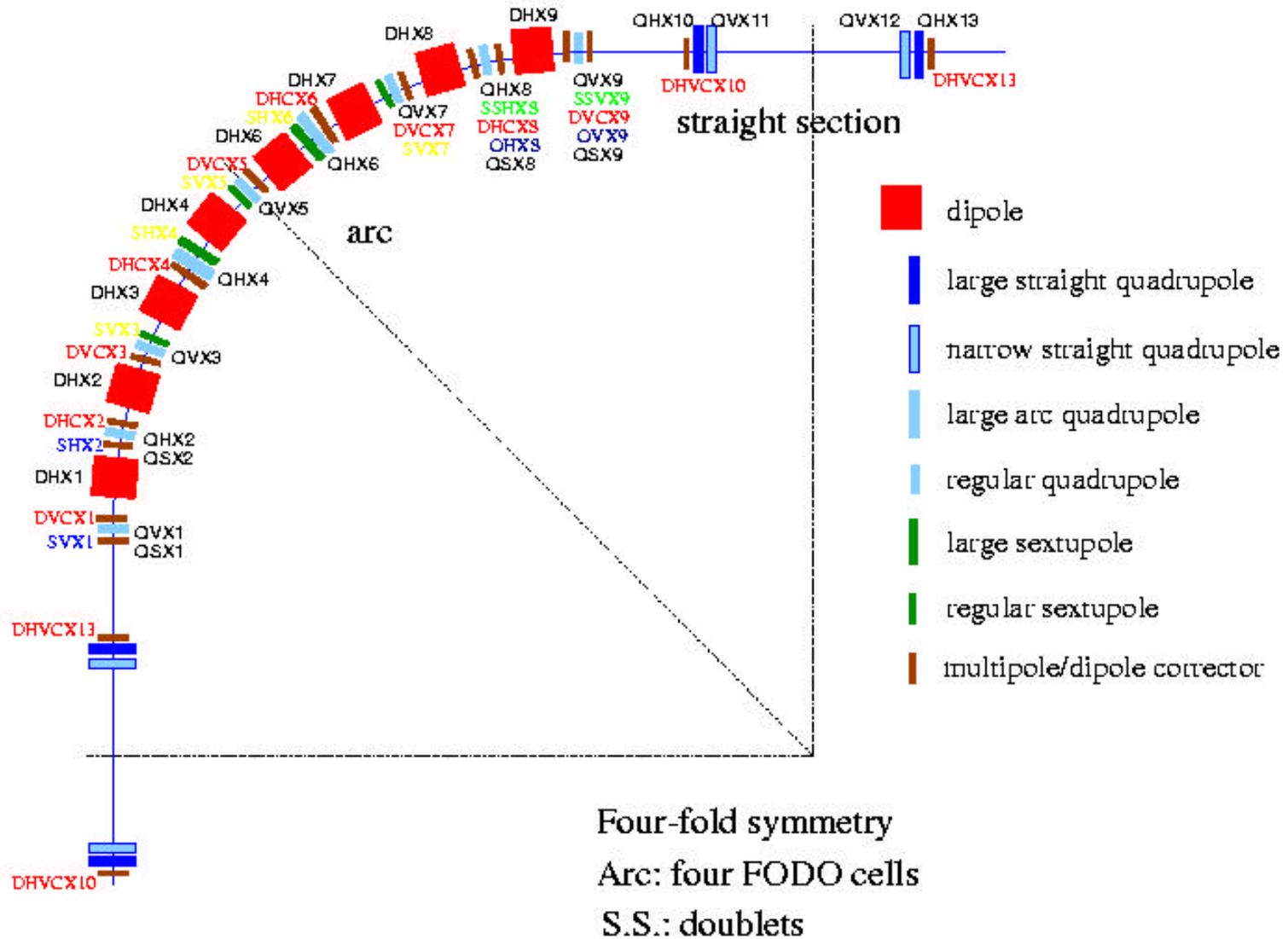
Magnet interference: main questions



- How much is the nonlinear multipole change?
 - All less than 1 unit (biggest change is b6 for Q-O: -0.93×10^{-4})
- Is the change in ITF systematic? How much variation between different layout?
 - According to simulation, ITF reductions are:
Q-S: -0.31%; Q-O: -0.31%; Q-C: -0.21%
 - For quads powered by the same PS, ITF reduction is the same
- Are the results consistent with measurement data?
 - Yes so far: (Q-C) measured $-(0.22 \pm 0.02)\%$; modeled -0.21%
- Can we do some more measurements?
 - BNL estimated cost is \$125k for setup/measuring 2 quarter cells
- Can we do more modeling?
 - Wuzheng has been working on them ...

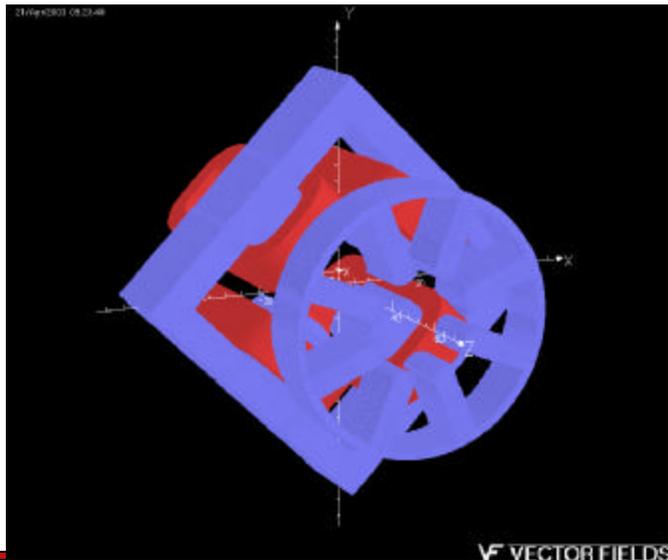
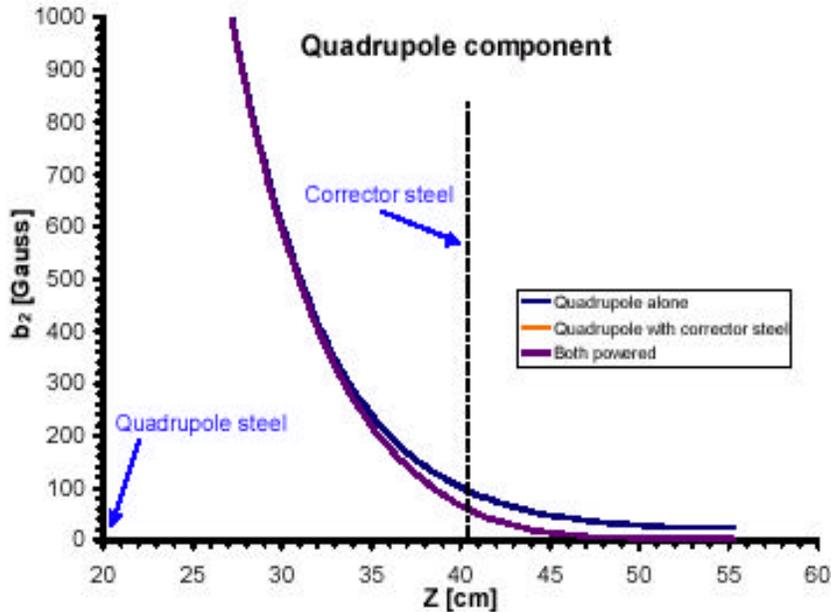
May 6–8, 2003

Ring magnet layout



Magnet interferences

(Y. Papaphilippou, J. Jackson, W. Meng et al, PAC2001)



- Magnet layout
 - “gap separation” (20cm) as min.
- Hardware consideration
 - D on standoff stainless steel tubes
 - Q on s.s. subframe, Al spacer (30Q)
 - C, S on s.s. bracket
- Bench measurements (C, Q)
 - ITF change by $-(2.2 \pm 0.2) \times 10^{-3}$; systematic; confirmed by modeling 2.13×10^{-3}
 - Multipole variation below 1×10^{-4}
- Calculations
 - Modeling agrees with measurement
 - Multipole $< 10^{-4}$ with added 1” iron
- Ind. PS family layout & trim quad w/ PS
- Not an issue so far!