

# ACCELERATOR SEMINAR

## “Stability of Ion Polarization in Figure-8 MEIC”

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The figure-8 shaped MEIC ion collider ring is “transparent” to the spin. In such a collider, any polarization orientation repeats every turn, i.e. the particles are in the region of a zero-integer spin resonance. Colliders transparent to the spin provide a unique capability to obtain any polarization direction of any particle species including deuterons using weak solenoids without affecting orbital parameters of the beam. The spin tune induced by the control solenoids must significantly exceed the strength of the zero-integer spin resonance, which contains a coherent part associated with errors in the collider’s magnetic structure and an incoherent part associated with the beam emittances. In a realistic collider lattice, the coherent part of the resonance strength is a few orders of magnitude greater than the incoherent part. We present calculations of the coherent and incoherent parts of the resonance strength in the MEIC ion collider ring for proton and deuteron beams. We analyze the possibility of compensating the coherent part of the resonance strength using static small solenoids, which will allow one to substantially improve the beam’s polarization properties as well as to significantly reduce the fields of the control solenoids. In particular, the spin reversal time of the spin-flipping system of the MEIC ion collider ring will be on the order of 1 ms instead of 1 s.

**Thursday, May 14, 2015  
11:00 a.m.  
CEBAF Center, Room F326-327**

**Coffee before seminar beginning at 10:45 a.m.**