Active magnetic shielding

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Ramsey method of oscillating fields

\[ h\nu_{\uparrow\uparrow} = |2\mu B + 2dE| \]

\[ h\nu_{\uparrow\downarrow} = |2\mu B - 2dE| \]
Ramsey method of oscillating fields

\[ h\nu_{\uparrow\uparrow} = |2\mu B + 2dE| \]

\[ h\nu_{\uparrow\downarrow} = |2\mu B - 2dE| \]
nEDM apparatus
Surrounding Field Compensation (SFC)

Three square-Helmholtz coil pairs connected to Software calculating currents based on readouts from vector Fluxgate magnetometers.
"Coil cage"

Second idea - orthogonal set of coils

\[ \Phi_{10} \]

\[ \Re(\Phi_{11}) \]

\[ \Im(\Phi_{11}) \]
Summary and plans

Work done so far

- Small coil cage prototype is built and will be examined
- Football supporting structure has been built

Future

- Finish the construction - wires for football structure and mounting of sensors
- Test both configurations, find optimal sensor positions and optimal current determination algorithm
- Build the bigger setup
Simulation with $r_{sensors} = 3\ m$ and $n_{sensors} = 7$

Relative difference, $x=0.000000$, SFC

Relative difference, $x=0.000000$

SFC system

Football-like system
Setup for simulation

(0,0,0)
R2
(25.0,10.0,50.0)
Position of sensors – spherical coordinates

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