

Feature of the Newly Defined Helicity

- The self helicity of the current-carrying field

$$H_{cj} = \int_{\Omega} (\mathbf{A}_c - \mathbf{A}_{p1}) \cdot (\mathbf{B}_c - \mathbf{B}_{p1}) d^3 \vec{x}$$

- The mutual helicity of the current-carrying field and referenced field

$$H_{cpj} = 2 \int_{\Omega} \mathbf{A}_{p1} \cdot (\mathbf{B}_c - \mathbf{B}_{p1}) d^3 \vec{x}$$

- \mathbf{B}_{p1} is very small \rightarrow small \mathbf{A}_{p1} \rightarrow small H_{CPJ} and $H_{cj} \sim H_j$
- $H_{cr} \sim H_{cj} = H_j$

Applications



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