

$$\mathbf{B}_{\perp}^{ext}(\mathbf{r}) = \frac{\mu_0 I_0}{4\pi} \left(\int_{-\infty}^{\infty} \frac{d\mathbf{z} \times (\mathbf{r} - \mathbf{r}_1)}{|\mathbf{r} - \mathbf{r}_1|^3} + \int_{-\infty}^{\infty} \frac{d\mathbf{z} \times (\mathbf{r} - \mathbf{r}_2)}{|\mathbf{r} - \mathbf{r}_2|^3} \right),$$