

ofunct

The function to be optimized.

[called by: [xoptim.](#)][calls: [setdof](#), [bs00aa](#), [toflux](#), [hdfint](#), [plassf](#) and [iccoil.](#)]**contents**

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1.1 overview

1. The degrees-of-freedom in the coil geometry are “unpacked”, [setdof](#).
2. Depending on the chosen weights, the objective functional is constructed as described below.

1.1.1 if **Wbnormal > 0 : compute normal field on plasma boundary**

1. The primary objective functional is to minimize the normal component of the magnetic field,

$$F_B \equiv \int B_n^2 ds. \tag{1}$$

2. The double integral is computed using [NAG:D01DAF](#).

1.1.2 if **Wepotent > 0 : compute electric-potential of adjacent coils**

1. The electric-potential between two curves, $\mathbf{x}_1(\theta)$ and $\mathbf{x}_2(\theta)$, is given by

$$F_e \equiv \int_{C_1} \int_{C_2} \frac{1}{\bar{r}^R} dl_1 dl_2, \tag{2}$$

where $\bar{r} \equiv r/s$, where $r \equiv |\mathbf{x}_1(\theta) - \mathbf{x}_2(\zeta)|$ and

- i. $s \equiv$ **scharge** is a length scaling factor;
- ii. $R \equiv$ **Rcharge** is the “exponent” of the interaction.

2. The double integral is computed using [NAG:D01DAF](#).