metrix

Calculates the metric quantities required for volume integrals.

[called by: ma00aa.] [calls: coords.]

contents

1.1 metrics

1. The Jacobian, $\sqrt{g}$, and the 'lower' metric elements, $g_{\mu\nu}$, are calculated by coords, and are provided on a regular grid in 'real-space', i.e. (θ, ζ), at a given radial location, i.e. where s is input.

1.2 plasma region

1. In the plasma region, the required terms are $\bar{g}_{\mu\nu} \equiv g_{\mu\nu}/\sqrt{g}$.

$$\begin{aligned}
\sqrt{g}\, g^{ss} &= \left(g_{\theta\theta}g_{\zeta\zeta} - g_{\theta\zeta}g_{\theta\zeta}\right)/\sqrt{g} \\
\sqrt{g}\, g^{s\theta} &= \left(g_{\theta\zeta}g_{s\zeta} - g_{s\theta}g_{\zeta\zeta}\right)/\sqrt{g} \\
\sqrt{g}\, g^{s\zeta} &= \left(g_{s\theta}g_{\theta\zeta} - g_{\theta\theta}g_{s\zeta}\right)/\sqrt{g} \\
\sqrt{g}\, g^{\theta\theta} &= \left(g_{\zeta\zeta}g_{ss} - g_{s\zeta}g_{s\zeta}\right)/\sqrt{g} \\
\sqrt{g}\, g^{\theta\zeta} &= \left(g_{s\zeta}g_{s\theta} - g_{\theta\zeta}g_{ss}\right)/\sqrt{g} \\
\sqrt{g}\, g^{\zeta\zeta} &= \left(g_{ss}g_{\theta\theta} - g_{s\theta}g_{s\theta}\right)/\sqrt{g}
\end{aligned} \tag{1}$$

1.3 FFTs

1. After constructing the required quantities in real space, FFTs provided the required Fourier harmonics, which are returned through global. (The "extended" Fourier resolution is used.)

metrix.h last modified on ; SPEC subroutines;