me00ab

Calculates the metric quantities required for volume integrals.

[called by: ma00aa.] [calls: co01aa.]

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1.1 metrics

1. The Jacobian, $\sqrt{g}$, and the 'lower' metric elements, $g_{\mu\nu}$, are calculated by co01aa, 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, `guvmne(1:mne,0:6)` and `guvmno(1:mne,0:6)`, which are returned through global. (The 'extended' Fourier resolution is used.)

me00ab.h last modified on 016-03-18 12:56:27.; SPEC subroutines;