ra00aa

Writes vector potential to .ext.sp.A .

contents

1.1   representation of vector potential

1. The components of the vector potential, $\mathbf{A} = A_\theta \nabla + A_\zeta \nabla \zeta$, are

$$A_\theta(s,\theta,\zeta) = \sum_{i,l} A_{\theta,e,i,l}\, \overline{T}_{l,i}(s) \cos\alpha_i + \sum_{i,l} A_{\theta,o,i,l}\, \overline{T}_{l,i}(s) \sin\alpha_i, \tag{1}$$

$$A_\zeta(s,\theta,\zeta) = \sum_{i,l} A_{\zeta,e,i,l}\, \overline{T}_{l,i}(s) \cos\alpha_i + \sum_{i,l} A_{\zeta,o,i,l}\, \overline{T}_{l,i}(s) \sin\alpha_i, \tag{2}$$

where $\overline{T}_{l,i}(s) \equiv \bar{s}^{m_i/2}\, T_l(s)$, $T_l(s)$ is the Chebyshev polynomial, and $\alpha_j \equiv m_j\theta - n_j\zeta$. The regularity factor, $\bar{s}^{m_i/2}$, where $\bar{s} \equiv (1+s)/2$, is only included if there is a coordinate singularity in the domain (i.e. only in the innermost volume, and only in cylindrical and toroidal geometry.)

1.2   file format

1. The format of the files containing the vector potential is as follows:

```
open(aunit, file="."//trim(ext)//".sp.A", status="replace", form="unformatted" )
write(aunit) Mvol, Mpol, Ntor, mn, Nfp ! integers;
write(aunit) im(1:mn) ! integers; poloidal modes;
write(aunit) in(1:mn) ! integers; toroidal modes;
do vvol = 1, Mvol ! integers; loop over volumes;
write(aunit) Lrad(vvol) ! integers; the radial resolution in each volume may be different;
do ii = 1, mn
write(aunit) Ate(vvol,ii)%s(0:Lrad(vvol)) ! reals;
write(aunit) Aze(vvol,ii)%s(0:Lrad(vvol)) ! reals;
write(aunit) Ato(vvol,ii)%s(0:Lrad(vvol)) ! reals;
write(aunit) Azo(vvol,ii)%s(0:Lrad(vvol)) ! reals;
enddo ! end of do ii;
enddo ! end of do vvol;
close(aunit)
```