hi
$$=(r_{ij}, r_{ih}, \theta_{jih}) = \eta \cdot \exp[r(r_{ij} - \alpha)^{-1} + r(r_{ih} - \alpha)^{-1}] \cdot (\cos\theta_{jih} + \frac{1}{3})^2$$

$$\cos\theta_{jih} = \frac{r_{ij}^2 + r_{ih}^2 - r_{ih}^2}{2 \times r_{ij} \times r_{ih}}$$

*
$$\frac{\partial h_i}{\partial \bar{r}_{ij}} = \lambda \cdot \exp\left[r(\bar{r}_{ij} - a)^{\frac{1}{4}}r(\bar{r}_{ih} - a)^{\frac{1}{4}}\right] \cdot (-r)(\bar{r}_{ij} - a)^{\frac{1}{2}} \cdot (\cos\theta_{ji}h + \frac{1}{3})^2$$

+
$$\Re \exp\left[r(r_{ij}-a)^{-1}+r(r_{ih}-a)^{-1}\right]\cdot\mathcal{A}(\cos\theta_{jih}+\frac{1}{3})\cdot\left(\frac{r_{ij}^2-r_{ih}^2+r_{jh}^2}{\mathcal{A}\times r_{ij}^2\times r_{ih}}\right)$$

$$= \gamma \cdot \exp\left[r(r_{ij} - a)^{\frac{1}{4}} r(r_{ih} - a)^{\frac{1}{4}}\right] \cdot \left(\cos\theta_{jih} + \frac{1}{3}\right) \left[\frac{r_{ij}^2 - r_{ih} + r_{jh}}{r_{ij}^2 + r_{ih}} - r(r_{ij} - a)^2 (\cos\theta_{jih} + \frac{1}{3})\right]$$

*
$$\frac{\partial h_i}{\partial \overline{r}_{ih}} = \eta \cdot \exp\left[r(\overline{r}_{ij} - a)^{\frac{1}{2}} + r(\overline{r}_{ih} - a)^{\frac{1}{2}}\right] \cdot (-r)(\overline{r}_{ih} - a)^{\frac{2}{2}}(\cos\theta_{jih} + \frac{1}{3})^2$$

+
$$\gamma \cdot \exp\left[r\left(r_{ij}-a\right)^{2}+r\left(r_{ih}-a\right)^{2}\right] \cdot \chi\left(\cos\theta_{jih}+\frac{1}{3}\right) \cdot \frac{\left(r_{ih}^{2}-r_{ij}^{2}+r_{jh}^{2}\right)}{\chi\left(r_{ih}^{2}+r_{ij}^{2}\right)}$$

$$= \lambda \cdot \exp\left[N(r_{ij}-a)^{\frac{1}{2}} + N(r_{ih}-a)^{\frac{1}{2}}\right] \cdot \left(\cos\Theta_{jih} + \frac{1}{3}\right) \cdot \left[\frac{r_{ih}-r_{ij}^{2}+r_{jh}}{r_{ih}\cdot r_{ij}}\right) - N(r_{ih}-a)^{2}\left(\cos\Theta_{jih} + \frac{1}{3}\right)$$