$$\hat{\Lambda} = \frac{1}{n}\sum_{i=1}^{n} (\nabla u)^T \nabla u$$

$\nabla u \in \mathbb{R}^n$ ie $n \times 1$

$\Lambda \in \mathbb{R}^{n \times n}$

$$R_n = \frac{Y_n - \hat{\mu}_N}{0} = \underline{\underline{u_i}}$$

$(\nabla u)(\nabla u)^T$

$\frac{Y_n}{\hat{\sigma}_{(n)}}$ $\frac{Y_i}{\hat{\sigma}_{(i)}} \rightarrow$ ie calculated without i! there would be then it would be fine!

$\int \det \Lambda(s)^{1/2} ds$

$\sum_{v \in V} \det \Lambda(v)^{1/2}$

volume 1 voxels

$= \int \frac{1}{V} \sum_{v \in V} (\det \Lambda(v))^{1/2}$

~~$R_n \perp\!\!\!\perp Y$~~ ~~$Y_n - \hat{\mu}_N$~~ $\perp\!\!\!\perp$ ∇u

$Y_n - \hat{\mu}_N \perp\!\!\!\perp \hat{\sigma}_n \mid \mu_n$

~~As such And $\mathbb{E}[(\nabla R_i)(\nabla R_i)^T]$~~

~~$= \mathbb{E}[\mathbb{E}[(\nabla R_i)(\nabla R_i)^T \mid Y_i]]$~~

$R_i, \nabla R_i$ are independent still as R_i is variance so maybe the proof still holds