$$f' \approx \frac{Y''}{\hat{\sigma}_1/\sqrt{n}}$$

$$f' = \frac{Y'}{\hat{\sigma}_1/\sqrt{n}}$$

$$Var(Y'') = \hat{\sigma}_2^2/n$$

$$\Rightarrow Var(f') = \hat{\sigma}_2^2 / \hat{\sigma}_1^2$$

So it follows that $\mathbb{E}[\hat{\varepsilon}_i(u)\hat{\varepsilon}_i(v)] \xrightarrow[n\to\infty]{} C(u,v)$

Also $\mathbb{E}[x_i x_i^T] = \Sigma_x$!

So the expectation of the inner parts of

$$\frac{1}{n}\sum_{i=1}^{n} \hat{\varepsilon}_i(u)\hat{\varepsilon}_i(v) x_i x_i^T$$ converge.

So triangular SLLN applies

$\Rightarrow$ this converges to $C(u,v)\Sigma_x$ under 8^{th} moments on ε, x_i!

Still need to check boundedness