$$\int \mathbb{E}\left[\,|\det f''|\,\mathbb{1}[f''<0]\,\Big|\,f'=0\right]\,dt\,p_t(0)\,dt$$

$$=\int \mathbb{E}\left[\,|f''_{(t)}|\,\mathbb{1}[f''_{(t)}<0]\,\mathbb{1}[f(t)>u]\,\Big|\,f(t)=0\right]\,p_t(0)\,dt$$

$$\begin{matrix} f' \\ f'' \end{matrix} \sim$$

(scribbled out)

$$\mathcal{N}\left(\begin{pmatrix} \delta \\ \delta \\ \Omega \end{pmatrix}\,\mathcal{N}\left(\begin{matrix} & & \Delta^T \\ \Delta & \Omega \end{matrix}\right)\begin{matrix} B. \\ A \end{matrix}\right.$$

$$\begin{matrix} A & B. \end{matrix}$$
$$\Rightarrow f''\,|\,f' \sim \mathcal{N}\left(\Delta \Lambda^{-1} f',\ \Omega - \Delta \Lambda^{-1}\Delta^T\right)$$

$$\longrightarrow f''\,|\,f'=0 \sim \mathcal{N}\left(0,\ \underline{\Omega - \Delta \Lambda^{-1}\Delta^T}\right)$$

$$= k(t)$$

$$\mathbb{E}\left[\,-f''\,\mathbb{1}[f''<0]\,\Big|\,f(t)=x,\ f'(t)=0\right]$$

is the expected value of a truncated Gaussian which should have a closed form