~~X(t)~~

~~X(L)~~

$$\nabla f(t) = \cancel{\sum_L \nabla K(t-s)} \sum_L \nabla K(t-L) X(L)$$

So $\mathrm{cov}\left(X(V), (\nabla f(t))_i \right) = \sum (\nabla K(t-L))_i \, c(L,V)$

which is cts in t

~~so $X(v) \sim N(\mu(t)$~~

So $X(V) \mid \nabla f(t) \sim \boxed{N(m(t), \Sigma(t))}$

where m, Σ are cts in t

$\Rightarrow E[\,|X(V)| \mid \nabla f(t)] = f(m, \Sigma) \to$ $\boxed{\text{find } f!}$

on wikipedia.

m, Σ, f cts, in t so can bound this on $B_r(t)$ so is bounded.

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cont from b4, $\boxed{(E[L \mid \nabla X(t)] \le M)}$

~~$\le E[\delta_\varepsilon(\nabla X(t)$~~ $= \int_{\mathbb{R}^n} \delta_\varepsilon(y)\, p_{\nabla X(t)}(y)\, dy$

$$\le \int_{B_r(\tau)} rM \, E[\delta_\varepsilon(\nabla X(t))]\, dt$$

goes to constant when divide by ε^N. so can take $r \to 0$

$\to rM \int_{B_r(\tau)} p_{\nabla X(t)}(0)\, dt$