1056-47-110 **Anna Skripka*** (askripka@math.tamu.edu), Department of Mathematics, Texas A&M University, College Station, TX 77843. *Traces of operator derivatives.* Preliminary report.

For a large class of admissible scalar functions f, we obtain scalar integral representations for operator derivatives $\frac{d^k}{dt^k} f(H_0 + tV)$ inside a normal faithful semi-finite trace τ, with an initial operator H_0 belonging to a semi-finite von Neumann algebra $\mathcal{A}$, an increment V to a τ-Hilbert-Schmidt class of $\mathcal{A}$, and the values of k determined by further properties of $\mathcal{A}$. These representations imply, in particular, that computation of $\tau\left[\frac{d^k}{dt^k} f(H_0 + tV)\right]$ can be reduced to the computation of $\frac{d^{k-1}}{dt^{k-1}} f'(H_0 + tV)$ and that the remainder of a Taylor-type approximation $\tau\left[f(H_0 + V) - \sum_{k=0}^{p-1} \frac{1}{k!} \frac{d^k}{dt^k}\big|_{t=0} f(H_0 + tV)\right]$ is a bounded functional on $f^{(p)}$. (Received July 27, 2009)