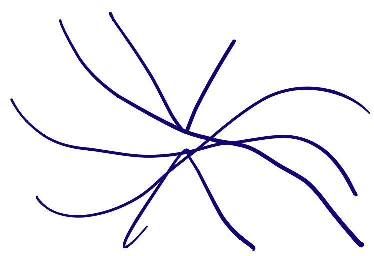
$$P_{\Sigma_{in}} = \sum_{n\in\mathbb{N}} |\varphi_n\rangle\langle\varphi_n| \qquad (\varphi_n)_{n\in\mathbb{N}} \text{ ONB in } \mathcal{H}(\Sigma_{in})$$

$$P_-^A = U^A_{A\Sigma_{in}}\, P_{\Sigma_{in}}\, U^A_{\Sigma_{in}A}$$

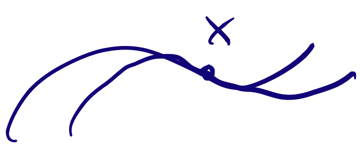
$$\underset{\mathcal{H}_{\Sigma'}}{\underset{\cap}{\phi(x)}} = \left[\int_\Sigma P_-^A(x',x)\, i_\gamma(d^4x)\, \underset{\underset{\mathcal{H}_\Sigma}{\cup}}{\psi}(x)\right]\Big|_{\Sigma'}$$

$$P^A_A = U^A_{A\Sigma_{in}}\, P_-\, U^A_{\Sigma_{in}A}$$



$P^A_\Sigma(\cdot,\cdot)$ sei Distr. so daß

$\forall \Sigma,\Sigma' \ \forall \ f\in C^\infty_c(\Sigma)$
$g \in C^\infty_c(\Sigma')$:



$$\langle f, U_{\Sigma A} P^A U_{A\Sigma'}\, g\rangle_\Sigma$$
$$= \int_\Sigma\int_{\Sigma'} \overline{f}(x)\, i_\gamma(d^4x)\, P_{\Sigma\Sigma'}(x,y)\, i_\gamma(d^4y)\, g(y)$$

$\Rightarrow$ $P(\cdot,\cdot)$ Dist. auf $C^A \times C^A$

C^∞_c und Lsg.
von $(i\not{D} - m)\psi = \not{A}\psi$

Ziel 1)

a) $W_\psi(x,x') \in I_2$

b) $(P^{\partial} - H)(x,x') \in I_2$

$\Longrightarrow$ P^{∂} ist truncated Hadamard
da z.B. $\log(x-x')^2 \in I^2_{loc}$

$$D_x^\mu = \partial_x^\mu + ieA^\mu(x)$$

$$[f](x) = f(x,x)$$

$$P = (+i\not{D} - m)(+i\not{D} - m)$$

DEF: $H(x, x') = \ldots \omega_1 \ldots \omega_2 \ldots \omega_3$
$+ \mathcal{C}^\infty$

wenn war $\mathcal{C}^\infty$-Hadamard,

und

$T(x, x') = \ldots \omega_1 \ldots \omega_2 + I_2$

wenn war I_2-Hadam.

$$\boxed{\textbf{Thm:}\ \ \rho^\lambda \text{ ist } I_2\text{-Hadamard.}}$$

ρ^A ist $\mathcal{C}^\infty$-Hadamard

$\Downarrow$

ρ^λ ist I_2-Hadam

$+ I_2$

P_2 st I_1 - blue.

$P_A - P_2$ st I_2

$N = 2$

$$\mathcal{R}_\pm(x) = T_0(x, \cdot) + T_1(x, \cdot) + T_2(x, \cdot) + \underbrace{\sum_{j > N} \cdots}_{\in \mathcal{C}}$$

$$\mathcal{R}^\varepsilon_\pm(x) = 0 \quad \cancel{0} \quad 0 \quad - \quad + \underbrace{\sum_{j > N} b_\varepsilon \cdots}_{\in \cap \; \mathcal{C}^\infty \setminus \mathrm{diag}}$$

$$P \mathcal{R}^\varepsilon_\pm(x) = \delta_x(\cdot) + \underbrace{K_\pm(x, \cdot)}_{\mathcal{C}^\infty}$$

$(\partial \cancel{x} - A - u)^2$

$$(i\gamma\partial - m)\, \mathcal{D}^{\varepsilon}_{\pm}(x) = \delta_x(\cdot) + K_{\pm}(x, \cdot)$$

$$C_A(F, G) = 2\iint \bar{F}\, P_- \, S_{A, A+F}\, P_+\, S_{A, A+G}\, \gamma^0 \ldots$$

$$u \gamma^0 \, u$$

$$P^A_- \neq P^A_+ \gamma^0 P^0_-$$

$$P^A \int G^A(x, y)\, f(y)\, dy = f(x)$$

$$P^A(x, y) = \mathcal{D}^A_-(x, y) - \mathcal{D}^A_+(x, y)$$

prop.

Time Green.

$$u^A P_- u^A = \cdot 3\partial 3 + \kappa_0 G$$