$$\mathcal{Q} \urcorner_{t_0}$$

$$t|\acute{t}\overset{\sharp}{\llcorner} Q = \exp\left(\underline{t-\acute{t}}\,\widetilde{\underline{\mathcal{H}}+\mathcal{V}}\right)$$

$$\underset{P:\acute{P}}{t|\acute{t}\overset{\sharp}{\llcorner}} Q = {}^{P}\left(\exp\left(\underline{t-\acute{t}}\,\widetilde{\underline{\mathcal{H}}+\mathcal{V}}\right)\right)_{\acute{P}}$$

$${}^{P}\widetilde{e^{-t\underline{\Delta/2+\mathcal{V}}}\urcorner} = \int_{d\acute{P}}^{Q} {}^{\acute{P}}\urcorner \int_{d\mathbb{P}}^{\overset{-t/2|t/2}{P:\acute{P}}\llcorner Q} \exp - \int^{-t/2|t/2} \underline{\mathcal{L}}_{\mathbb{P}} \exp\left(-\int_{d\tau}^{-t/2|t/2} \mathcal{V}\left({}^{\tau}\mathbb{P}\right)\right)$$

$$= \int_{d\acute{P}}^{Q} {}^{\acute{P}}\urcorner \int_{dW(\mathbb{P})}^{\overset{-t/2|t/2}{P:\acute{P}}\llcorner Q} \exp\left(-\int_{d\tau}^{-t/2|t/2} \mathcal{V}\left({}^{\tau}\mathbb{P}\right)\right)$$

$$|t\acute{t}|\overset{\sharp}{\llcorner} Q = \text{ tr } \exp\left(\underline{t-\acute{t}}\,\widetilde{\underline{\mathcal{H}}+\mathcal{V}}\right)$$

$$\text{RHS } = \int_{Q}^{dP} {}^{P}e^{\underline{t-\acute{t}}\,\widetilde{\underline{\mathcal{H}}+\mathcal{V}}} = \int_{Q}^{dP} \int_{d\mathbb{P}}^{\overset{t|\acute{t}}{P:P}\llcorner Q} \exp\left(\frac{i}{1/2}\int^{|t\acute{t}|} \mathcal{L}_{\mathbb{P}}\right)$$

$$= \int_{d\mathbb{P}}^{|t\acute{t}|\llcorner Q} \exp\left(\int^{|t\acute{t}|} \mathcal{L}_{\mathbb{P}}\right) = |t\acute{t}|\overset{\sharp}{\llcorner} Q = \int_{d\mathbb{P}}^{|t\acute{t}|\llcorner Q} \exp\left(\int^{|t\acute{t}|} \underline{\mathcal{L}}_{\mathbb{P}}\right) \exp\left(\int^{|t\acute{t}|} \mathcal{V}\left(\mathbb{P}\right)\right)$$

$$\text{tr } e^{\beta\underline{\mathcal{H}+\mathcal{V}}} = \int_{Q}^{dP} {}^{P}e^{\beta\underline{\mathcal{H}+\mathcal{V}}} = \int_{d\mathbb{P}}^{|0\beta|\llcorner Q} \exp\left(\int^{|0\beta|} \underline{\mathcal{L}}_{\mathbb{P}}\right) \exp\left(\int^{|0\beta|} \mathcal{V}\left(\mathbb{P}\right)\right)$$