

$$\begin{aligned}
S(q, R) &= \int_{|t| < R} \mathrm{d}t \, L(T_t q, t) = \int_{|t| < R} \mathrm{d}t \, \frac{\partial}{\partial t} W(T_t q, t) \\
&= W(T_R q, R) - W(T_{-R} q, -R)
\end{aligned}$$