

$$\begin{array}{ccc}
S[t^{-1}] & \xrightarrow{\phi} & S[tt'^{-1}] \\
\downarrow \mathcal{F} & & \downarrow \mathcal{F} \\
S[U^{-1}] \otimes_{S[t^{-1}]} \Omega_{S[t^{-1}]/R} & \xrightarrow{1 \otimes D\varphi} & S[U^{-1}] \otimes_{S[t^{-1}]} (S[t^{-1}] \otimes_{S[t^{-1}]} \Omega_{S[tt'^{-1}]/R}) \\
\downarrow \gamma_t & & \downarrow f \\
S[U^{-1}] \otimes_{S[t^{-1}]} (S[t^{-1}] \otimes_S \Omega_{S/R}) & \xrightarrow{\phi} & S[U^{-1}] \otimes_{S[tt'^{-1}]} \Omega_{S[tt'^{-1}]/R} \\
\downarrow \gamma_{tt'} & & \downarrow \gamma_{tt'} \\
S[U^{-1}] \otimes_{S[t^{-1}]} (S[t^{-1}] \otimes_S \Omega_{S/R}) & \xrightarrow{\phi} & S[U^{-1}] \otimes_{S[tt'^{-1}]} (S[tt'^{-1}] \otimes_S \Omega_{S/R})
\end{array}$$

$$\begin{array}{ccc}
\frac{s}{t} & \xrightarrow{\varphi} & \frac{s}{tt'} \\
\downarrow d_{S[t^{-1}]} & & \downarrow d_{S[tt'^{-1}]} \\
\frac{1}{t} d_{S[t^{-1}]}(s) + s d_{S[t^{-1}]}(\frac{1}{t}) & \xrightarrow{f \circ (1 \otimes D\varphi)} & \frac{t'}{tt'} d_{S[tt'^{-1}]}(s) + s d_{S[tt'^{-1}]}(\frac{t'}{tt'}) \\
\downarrow \gamma_t & & \downarrow \gamma_{tt'} \\
\frac{1}{t} d_S(s) - \frac{s}{t^2} d_S(t) & \xrightarrow{\phi} & \frac{t'}{tt'} d_S(s) - \frac{st'}{(tt')^2} d_S(tt') \quad (\mathbf{3})
\end{array}$$