2. $\dfrac{\partial w}{\partial t}+\dfrac{\partial^3 w}{\partial x^3}-6w\dfrac{\partial w}{\partial x}+\dfrac{1}{2t}w=0.$

Cylindrical Korteweg–de Vries equation.

The transformation

$$w(x,t)=-\frac{x}{12t}-\frac{1}{2t}u(z,\tau),\quad x=\frac{z}{\tau},\quad t=-\frac{1}{2\tau^2}$$

leads to the Korteweg–de Vries equation 5.1.1:

$$\frac{\partial u}{\partial \tau}+\frac{\partial^3 u}{\partial z^3}-6u\frac{\partial u}{\partial z}=0.$$

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