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

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:

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

References

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