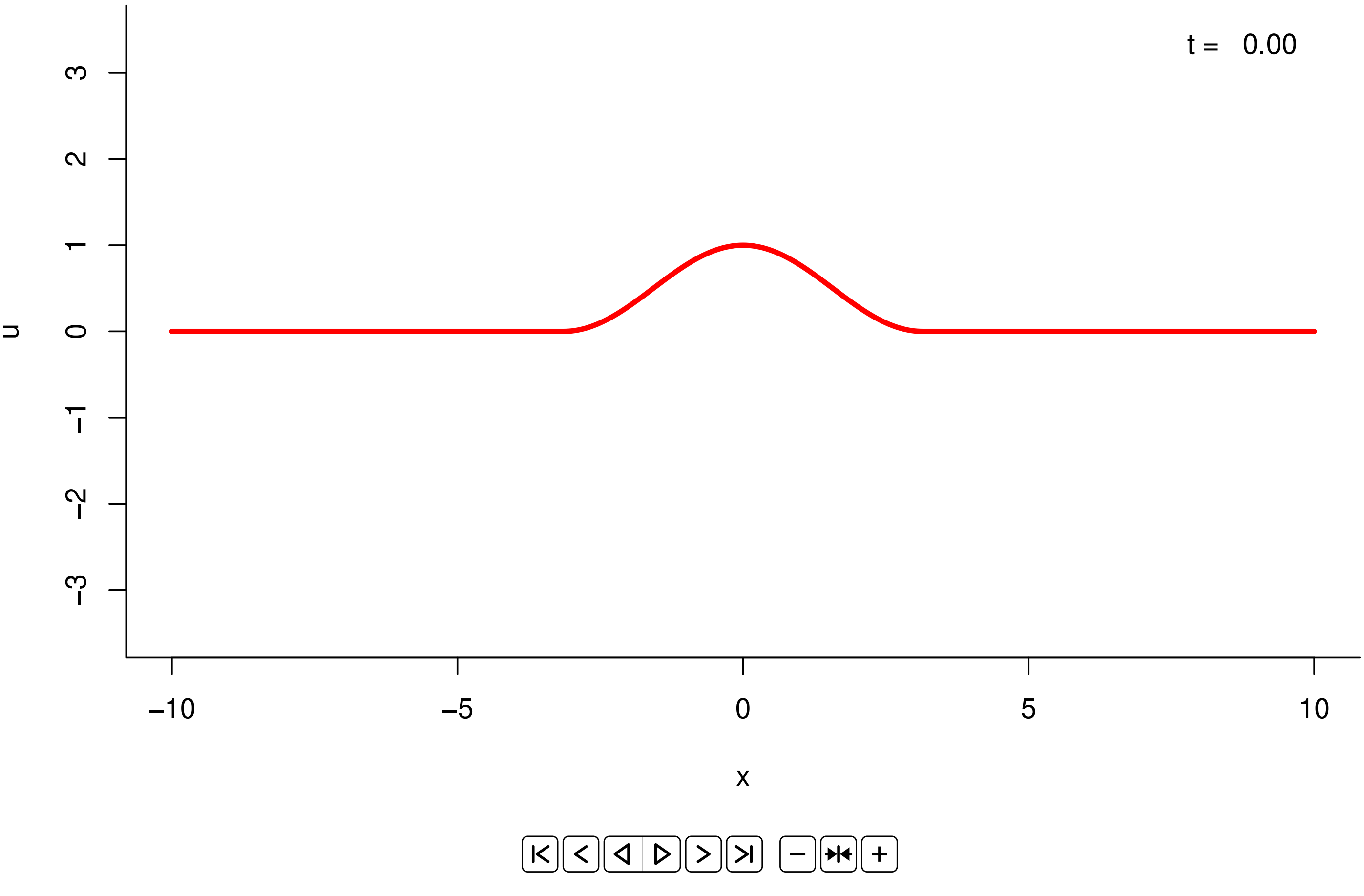
$$u_{tt} = u_{xx}, \qquad t > 0,\ x \in \mathbb{R}$$

$$u(0,x) = \varphi(x), \qquad x \in \mathbb{R}$$
$$u_t(0,x) = 0, \qquad x \in \mathbb{R}$$

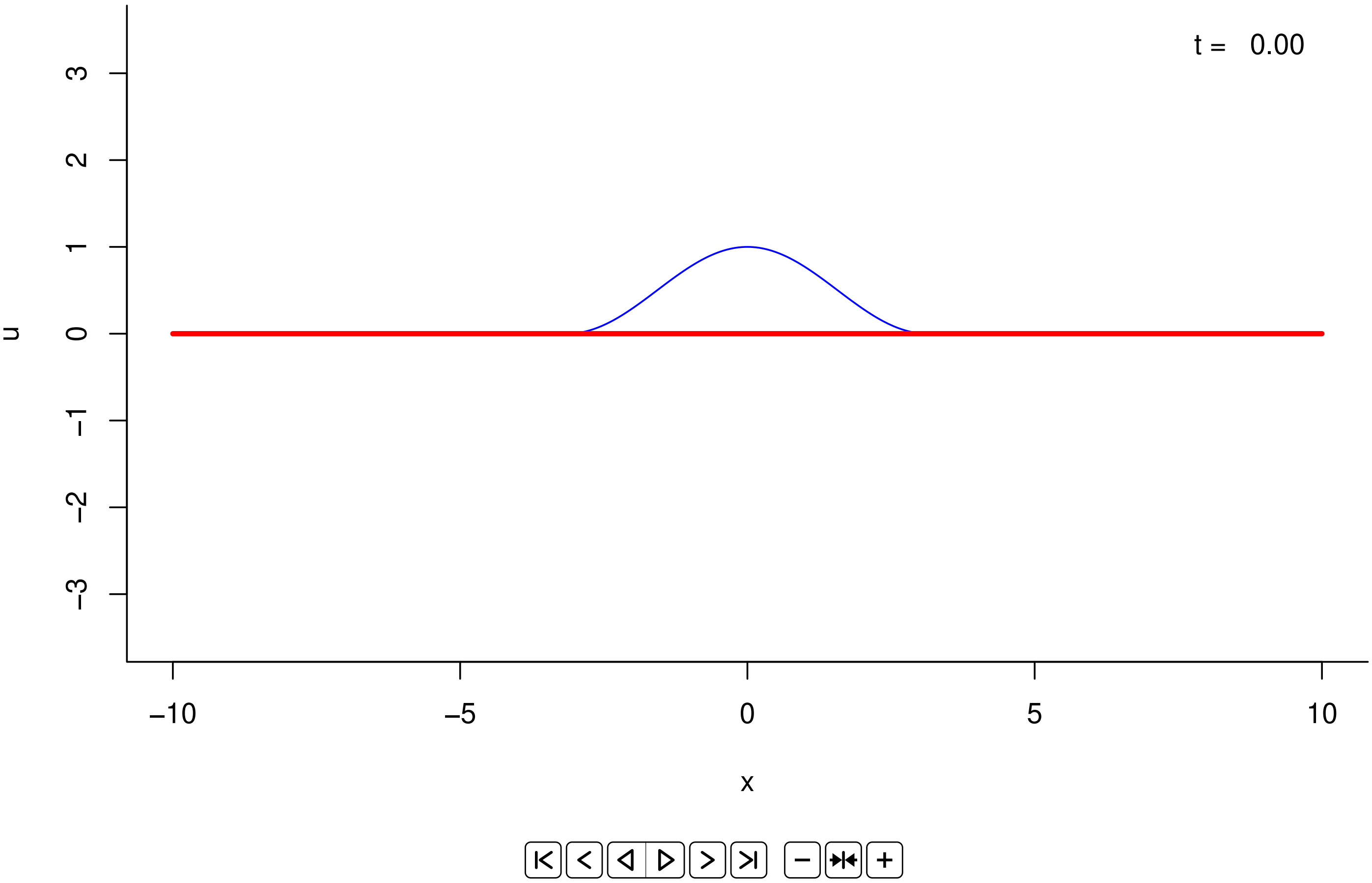
$$\varphi(x) = \begin{cases} \frac{1}{2}(1 + \cos x), & |x| \leq \pi \\ 0, & |x| > \pi \end{cases}$$



$$u_{tt} = u_{xx}, \qquad t > 0,\ x \in \mathbb{R}$$

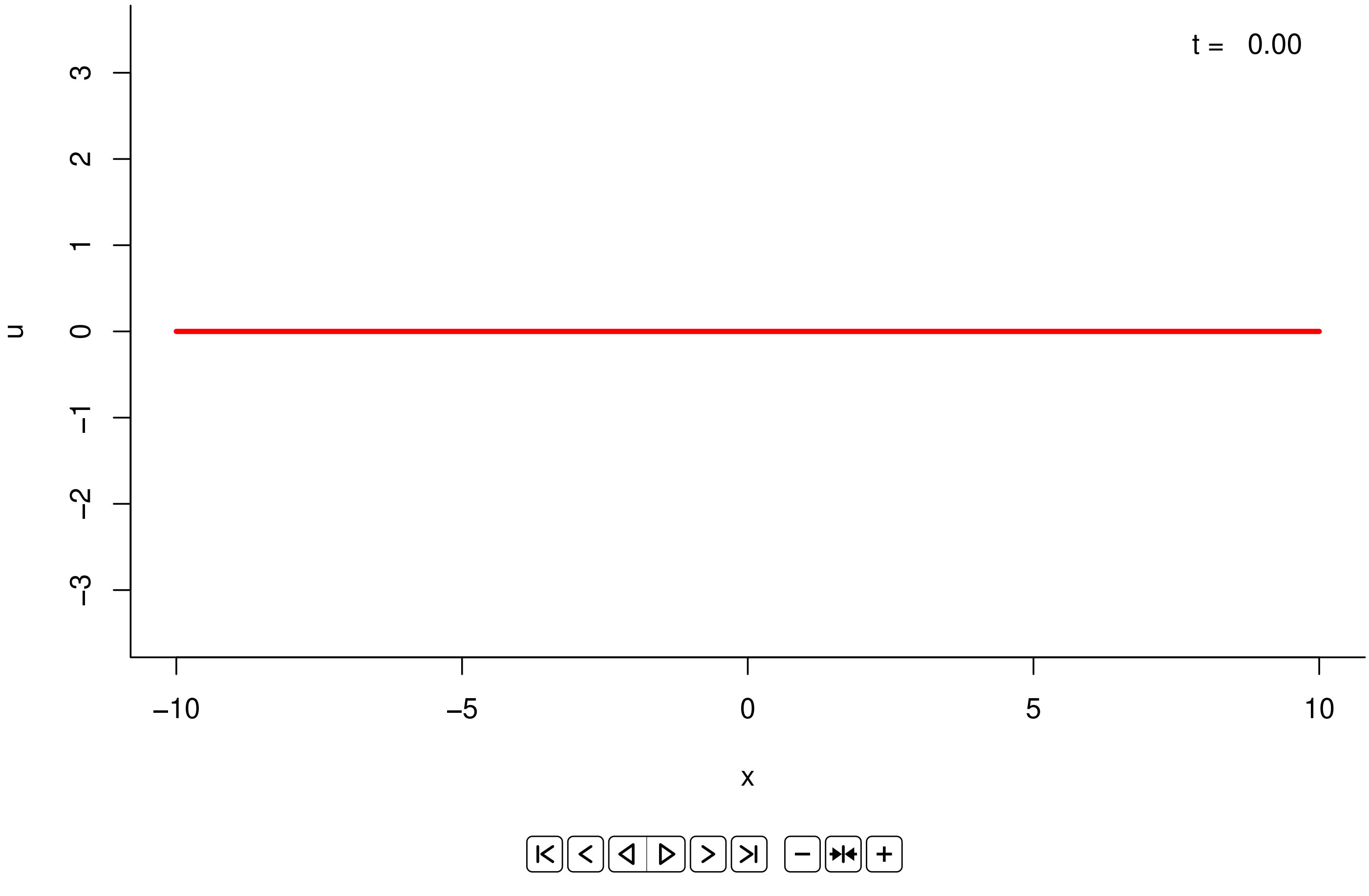
$$u(0,x) = 0, \qquad x \in \mathbb{R}$$
$$u_t(0,x) = \psi(x), \qquad x \in \mathbb{R}$$

$$\psi(x) = \begin{cases} \frac{1}{2}(1+\cos x), & |x| \le \pi \\ 0, & |x| > \pi \end{cases}$$



$$
\begin{aligned}
u_{tt} &= u_{xx} + f(t,x), && t>0,\ x\in\mathbb{R} \\
u(0,x) &= 0, && x\in\mathbb{R} \\
u_t(0,x) &= 0, && x\in\mathbb{R}
\end{aligned}
$$

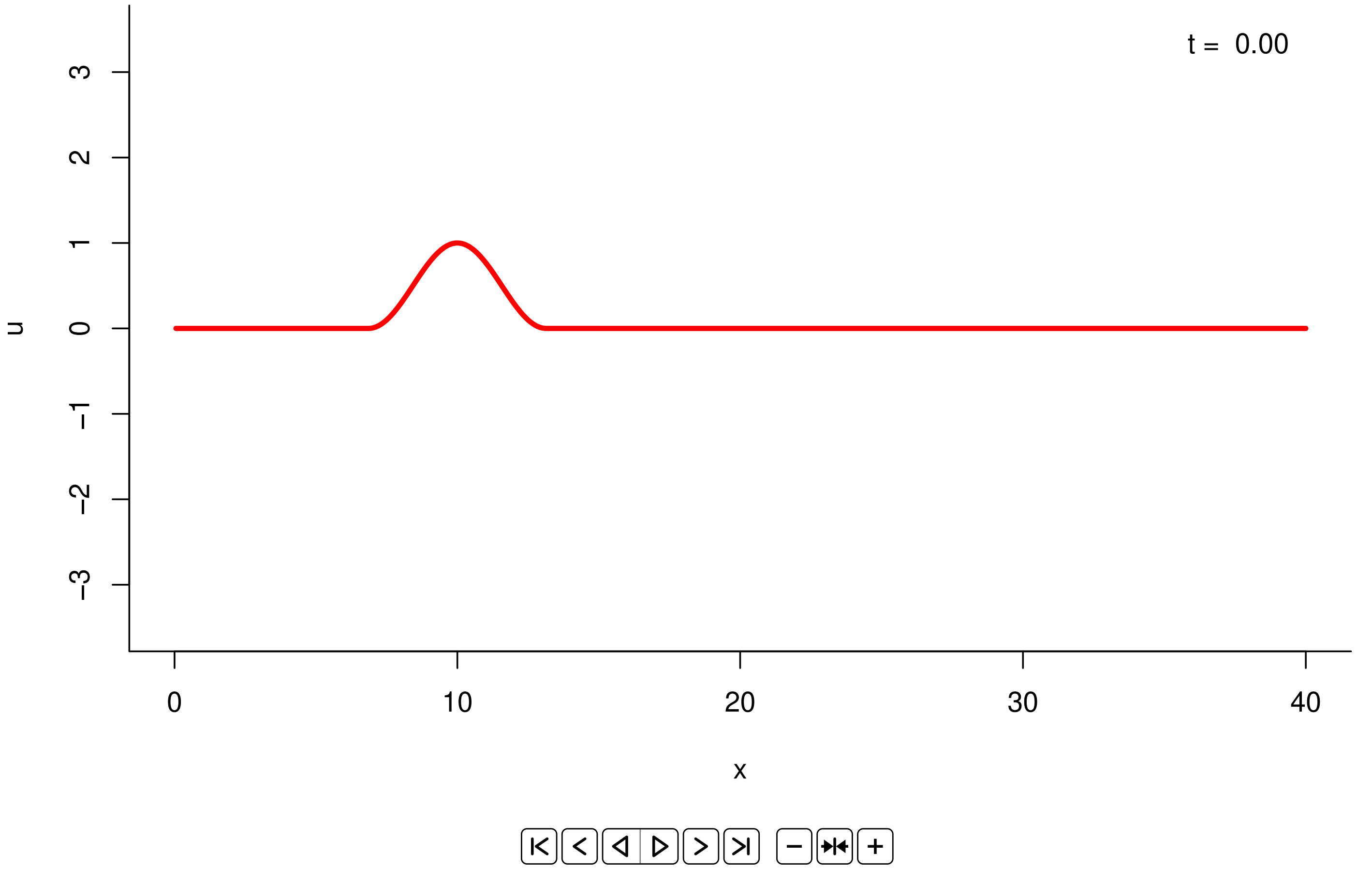
$$
f(t,x) = \begin{cases} \frac{1}{2}\sin(t)(1+\cos x), & |x|\le\pi \\ 0, & |x|>\pi \end{cases}
$$



$$u_{tt} = u_{xx}, \qquad t > 0,\ x > 0$$

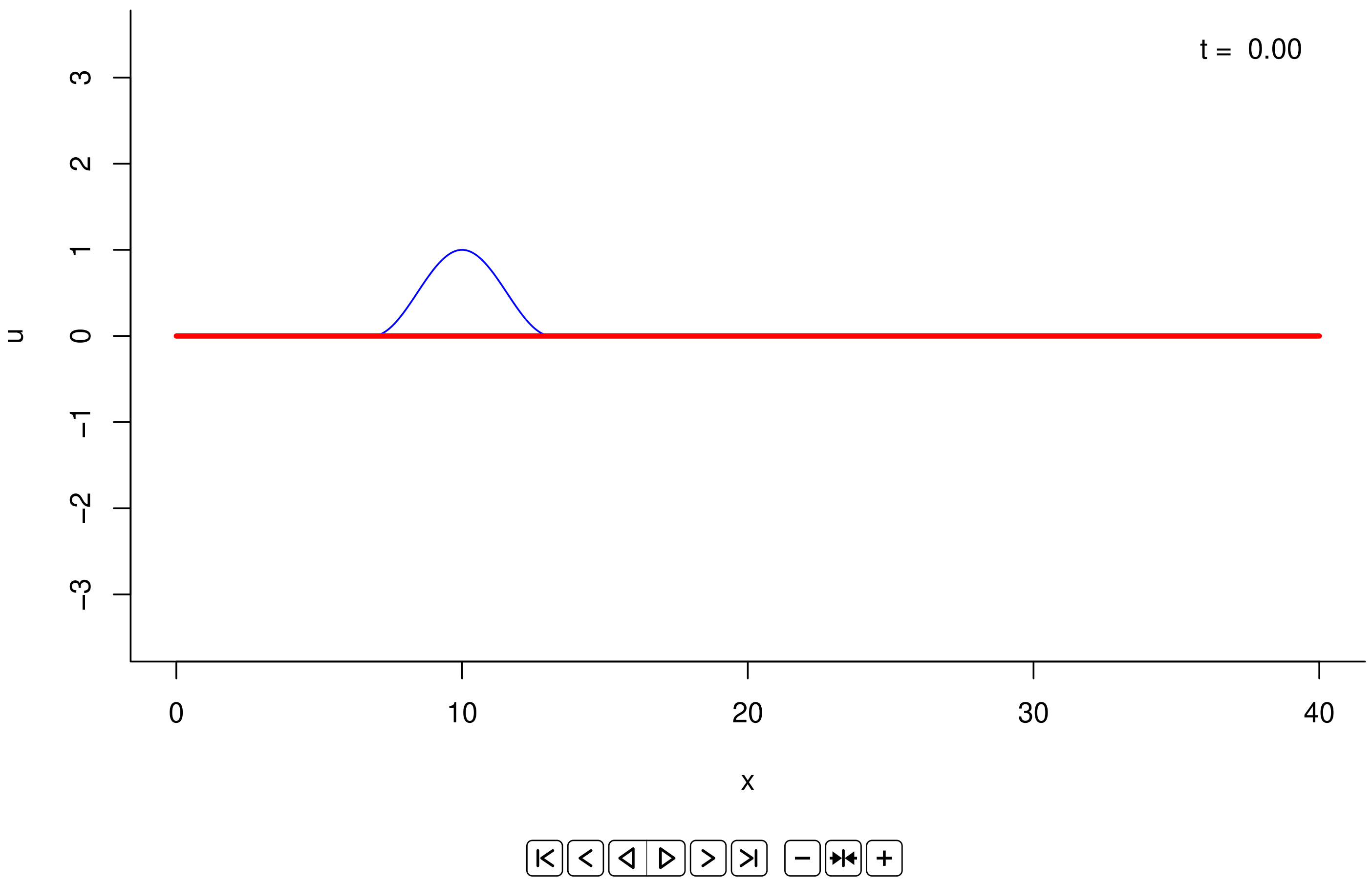
$$\begin{aligned} u(0,x) &= \varphi(x), && x > 0 \\ u_t(0,x) &= 0, && x > 0 \\ u(t,0) &= 0, && t > 0 \end{aligned}$$

$$\varphi(x) = \begin{cases} \frac{1}{2}\big(1 + \cos(x - 10)\big), & |x - 10| \leq \pi \\ 0, & |x - 10| > \pi \end{cases}$$



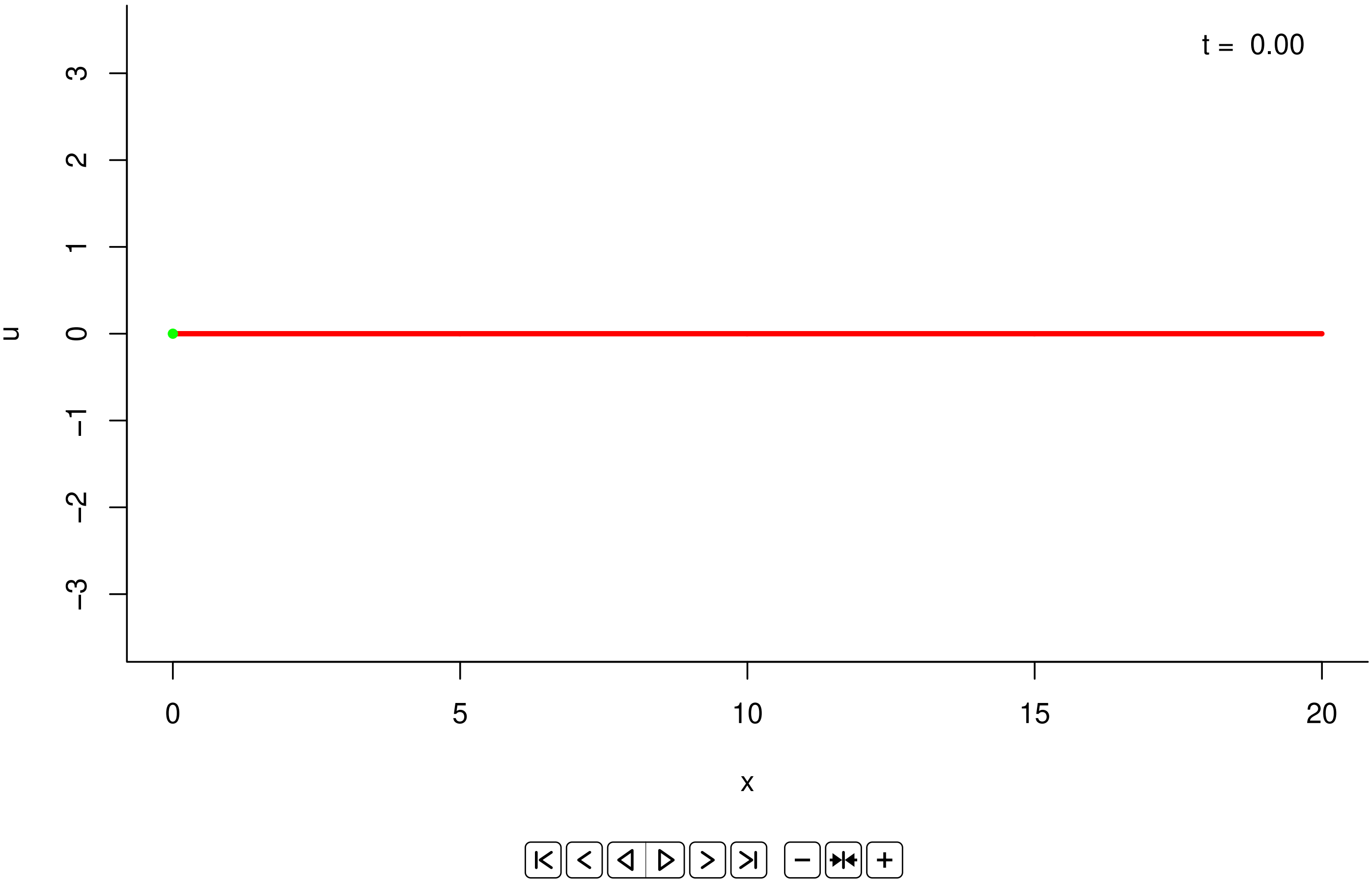
$$
\begin{aligned}
u_{tt} &= u_{xx}, && t > 0,\ x > 0 \\
u(0,x) &= 0, && x > 0 \\
u_t(0,x) &= \psi(x), && x > 0 \\
u(t,0) &= 0, && t > 0
\end{aligned}
$$

$$
\psi(x) = \begin{cases} \frac{1}{2}\big(1+\cos(x-10)\big), & |x-10| \le \pi \\ 0, & |x-10| > \pi \end{cases}
$$



$$u_{tt} = u_{xx}, \qquad t > 0,\ x > 0$$

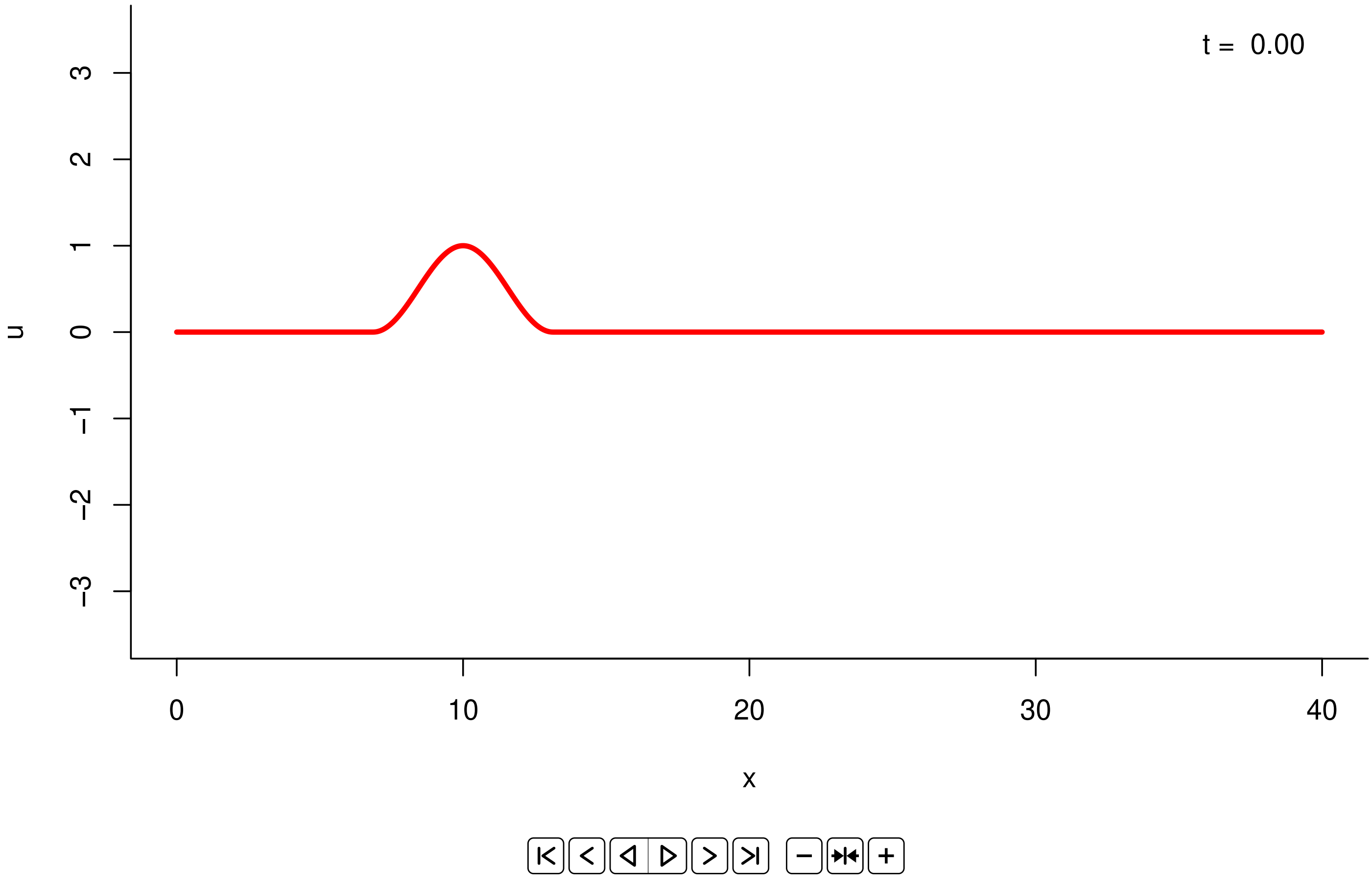
$$\begin{aligned} u(0,x) &= 0, && x > 0 \\ u_t(0,x) &= 0, && x > 0 \\ u(t,0) &= \sin t, && t > 0 \end{aligned}$$



$$u_{tt} = u_{xx}, \qquad t > 0,\ x > 0$$

$$\begin{aligned} u(0,x) &= \varphi(x), && x > 0 \\ u_t(0,x) &= 0, && x > 0 \\ u_x(t,0) &= 0, && t > 0 \end{aligned}$$

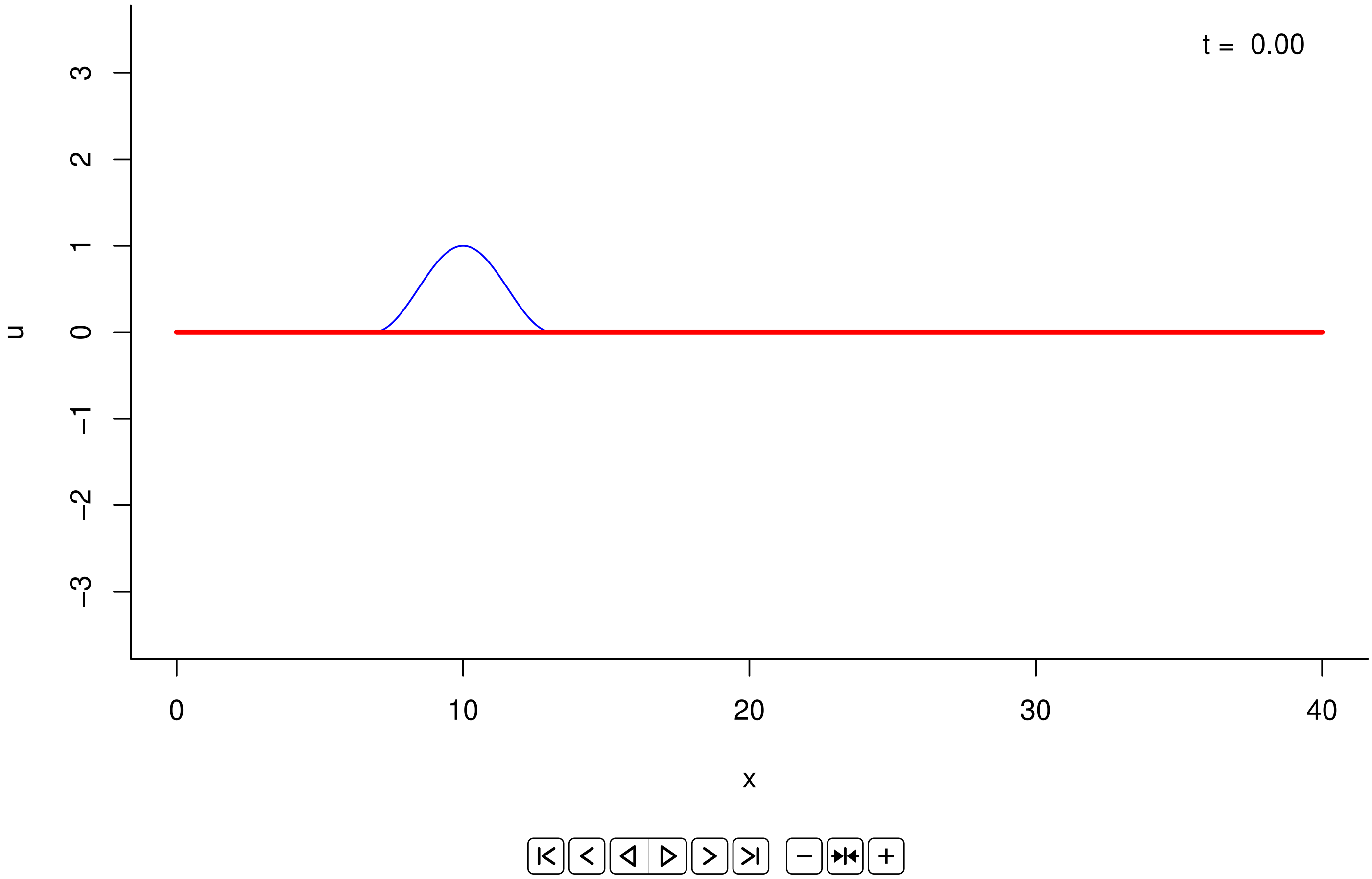
$$\varphi(x) = \begin{cases} \frac{1}{2}\big(1 + \cos(x - 10)\big), & |x - 10| \le \pi \\ 0, & |x - 10| > \pi \end{cases}$$



$$u_{tt} = u_{xx}, \qquad t > 0,\ x > 0$$

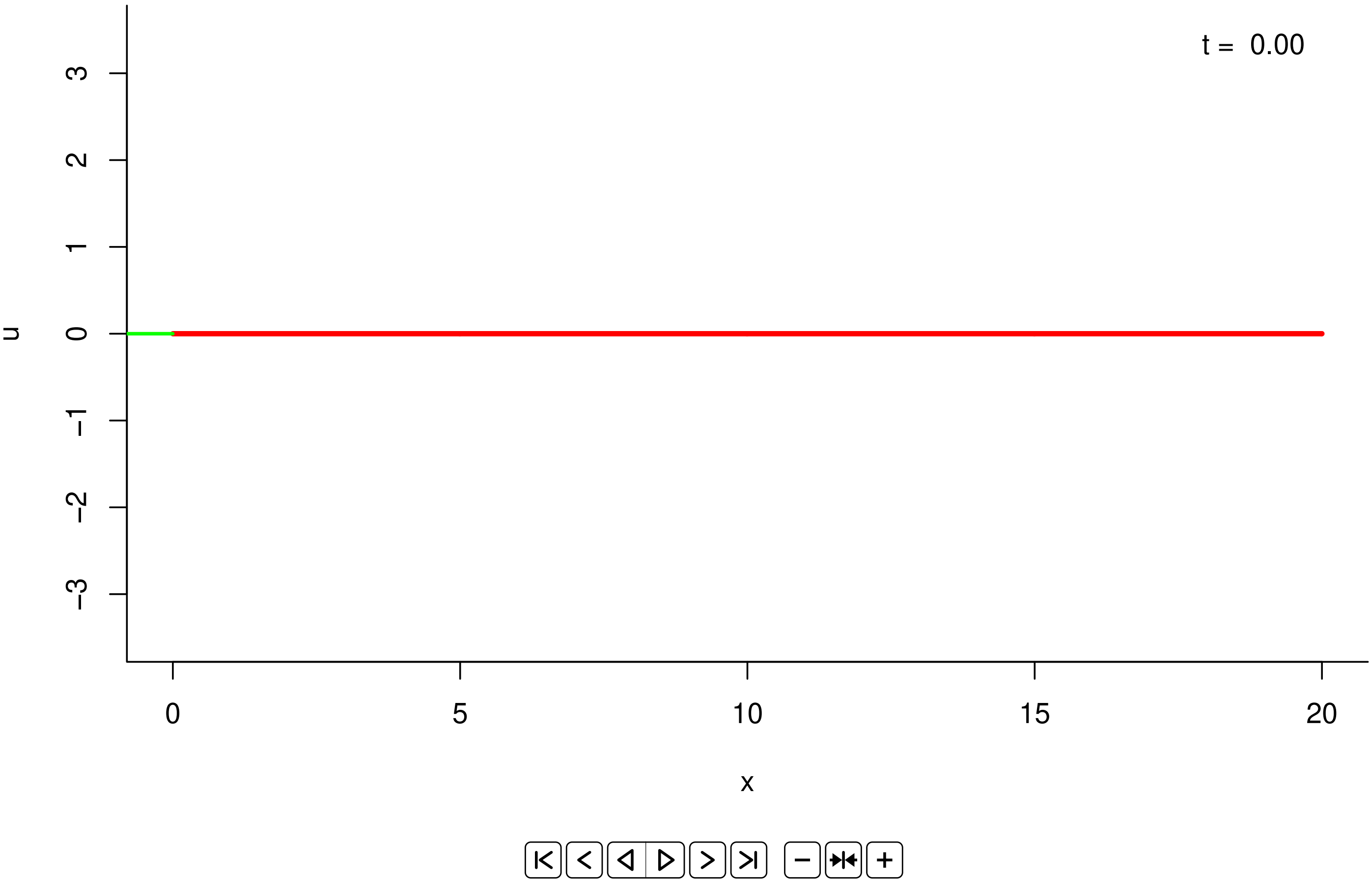
$$\begin{aligned} u(0,x) &= 0, & x > 0 \\ u_t(0,x) &= \psi(x), & x > 0 \\ u_x(t,0) &= 0, & t > 0 \end{aligned}$$

$$\psi(x) = \begin{cases} \frac{1}{2}\big(1+\cos(x-10)\big), & |x-10| \le \pi \\ 0, & |x-10| > \pi \end{cases}$$



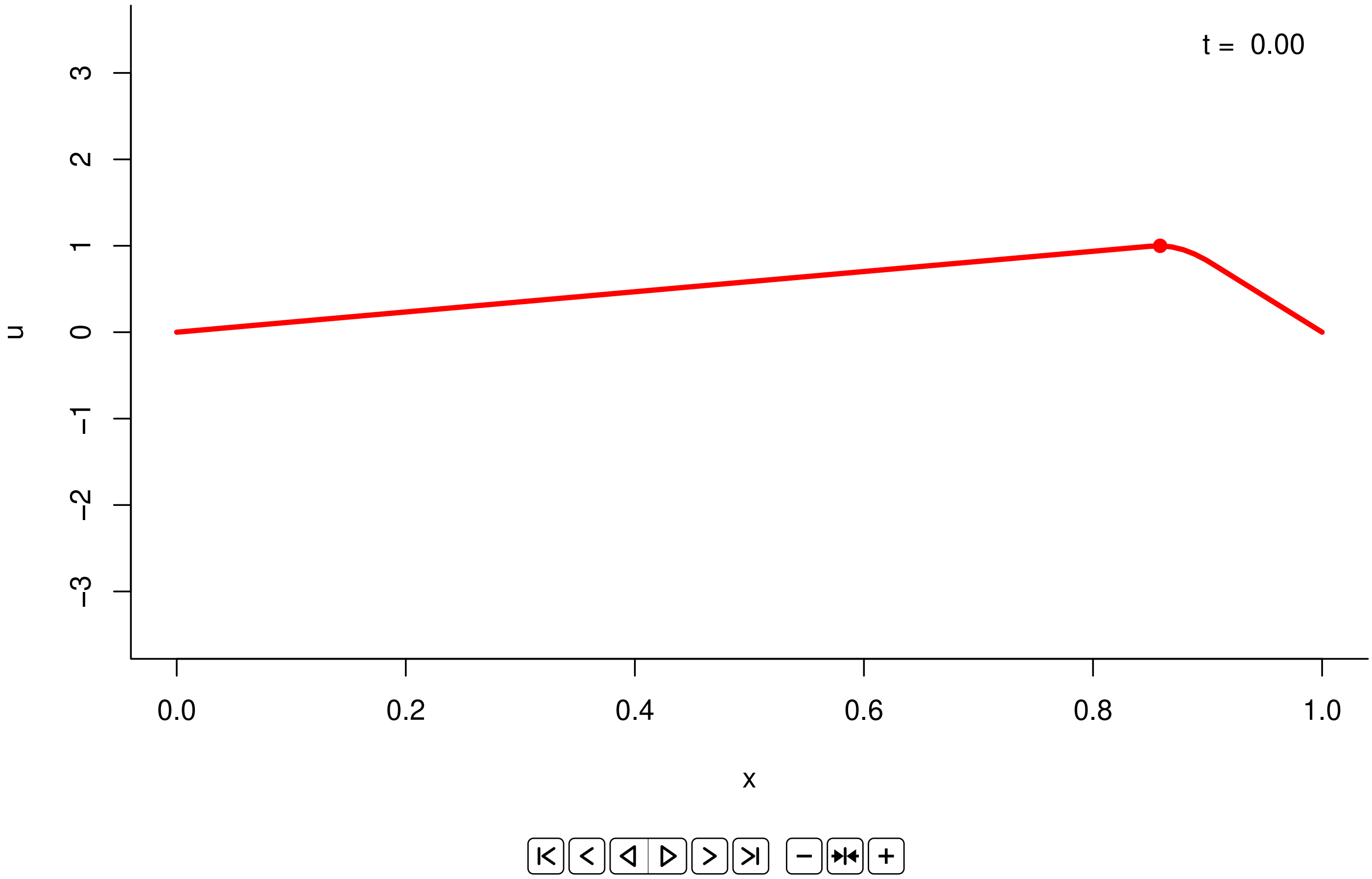
$$u_{tt} = u_{xx}, \qquad t > 0,\ x > 0$$

$$\begin{aligned} u(0,x) &= 0, & x > 0 \\ u_t(0,x) &= 0, & x > 0 \\ u_x(t,0) &= \sin t, & t > 0 \end{aligned}$$



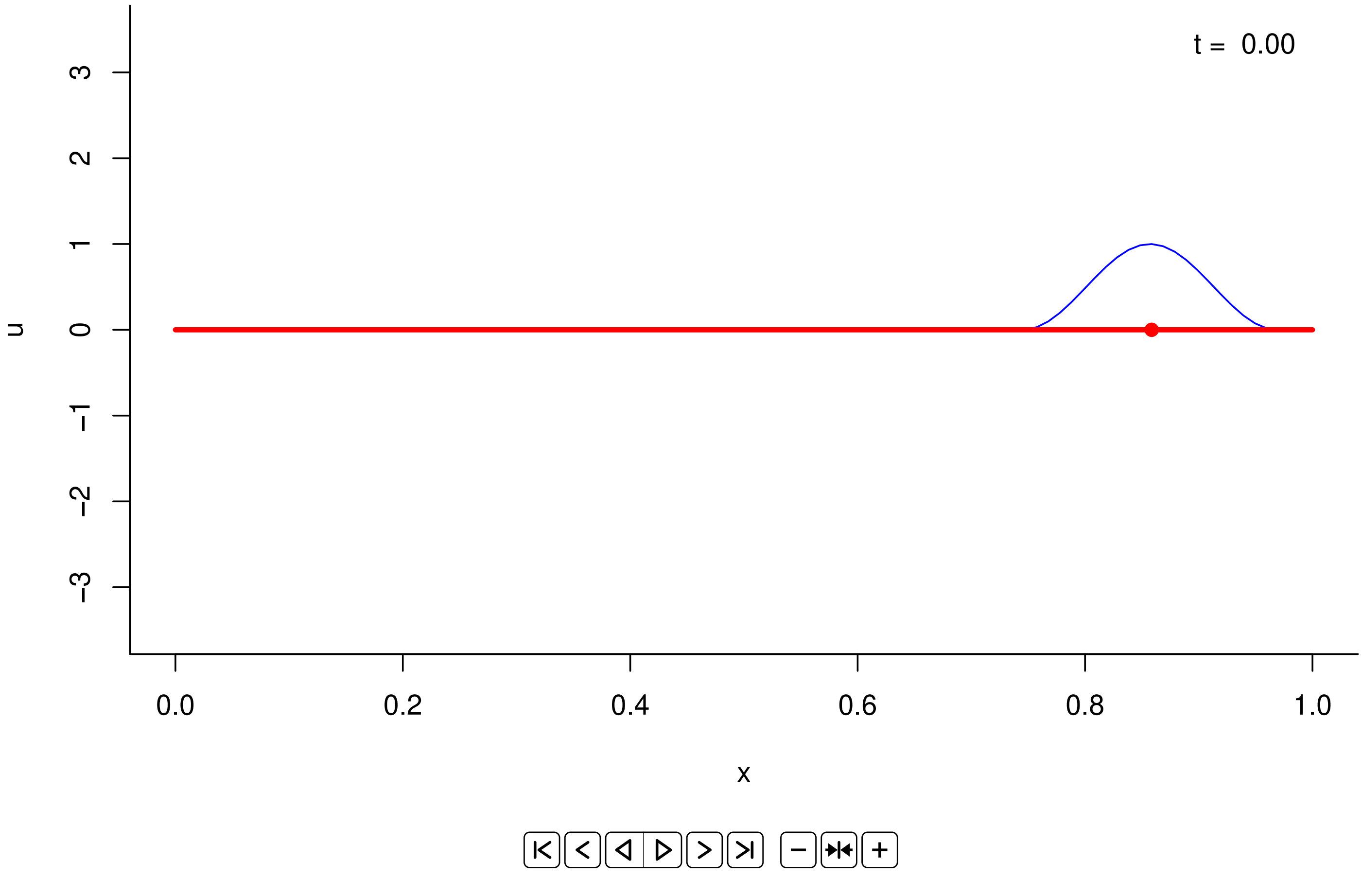
$$
\begin{aligned}
&u_{tt} = u_{xx}, && t > 0,\ 0 < x < 1 \\
&u(0,x) = \varphi(x), && 0 < x < 1 \\
&u_t(0,x) = 0, && 0 < x < 1 \\
&u(t,0) = 0, && t > 0
\end{aligned}
$$

$$
\varphi(x) = \begin{cases} 1{,}1704, & x < 0{,}8528, \\ \cos 14(x - \frac{6}{7}), & 0{,}8528 \le x \le 0{,}9022, \\ 0{,}2577(x-1), & x > 0{,}9022 \end{cases}
$$



$$
\begin{aligned}
u_{tt} &= u_{xx}, && t > 0,\ 0 < x < 1 \\
u(0,x) &= 0, && 0 < x < 1 \\
u_t(0,x) &= \psi(x), && 0 < x < 1 \\
u(t,0) &= 0, && t > 0
\end{aligned}
$$

$$
\psi(x) = \begin{cases} \frac{1}{2}\left(1 + \cos 28(x - \frac{6}{7})\right), & 28|x - \frac{6}{7}| \le \pi \\ 0, & 28|x - \frac{6}{7}| > \pi \end{cases}
$$



$$u_{tt} = u_{xx} + f(x), \qquad t > 0,\ \ 0 < x < 1$$

$$\begin{aligned} u(0,x) &= 0, & 0 < x < 1 \\ u_t(0,x) &= 0, & 0 < x < 1 \\ u(t,0) &= 0, & t > 0 \end{aligned}$$

$$f(x) = \begin{cases} \frac{1}{100}\left(1 + \cos 28(x - \frac{6}{7})\right), & 28|x - \frac{6}{7}| \le \pi \\ 0, & 28|x - \frac{6}{7}| > \pi \end{cases}$$