define an half-sine pulse

$Amax := 1$ $\omega_f := 571.2$ $\theta := 0$ $f_f := \frac{\omega_f}{2\cdot\pi}$ $T_f := \frac{1}{f_f}$ $tpulse := \frac{T_f}{2}$

$tpulse = 5.5 \times 10^{-3}$

Units!

$Amax := 1 \cdot g$ $\omega_f := 90.909\ Hza$ $f_f := \frac{\omega_f}{2\cdot\pi} = 90.909\ Hz$ $T_f := f_f^{-1}$ $tpulse := \frac{T_f}{2} = \left(5.5 \cdot 10^{-3}\right)\ s$

$$\frac{571.2}{2\cdot\pi} = 90.909$$

Total analysis time is	$tend := 200 \cdot T_f$
Number of time step	$nsteps := 5000$
Analysis time step	$\Delta t := \frac{tend}{nsteps}$
Time range	$t := 0, \Delta t .. tend$

$tend := 200 \cdot T_f = 2.2\ s$

$nsteps := 5000$

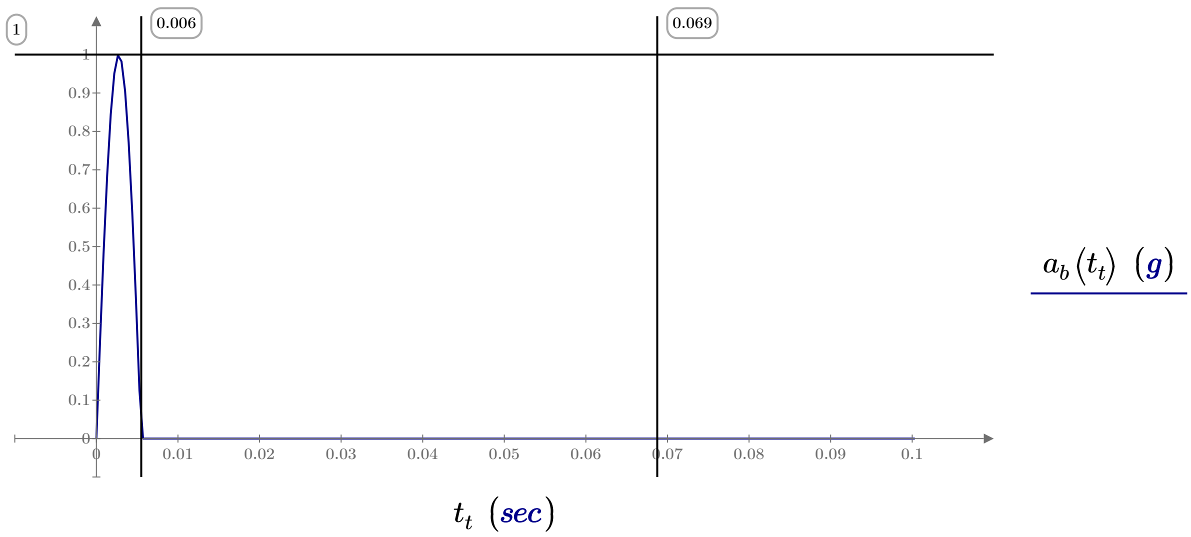
$\Delta t := \frac{tend}{nsteps} = \left(4.4 \cdot 10^{-4}\right)\ s$

$t_t := 0 \cdot s, \Delta t .. tend$

$$a_b(t) := \begin{cases} Amax \cdot \sin(\omega_f \cdot t + \theta) & \text{if } t \le tpulse \\ 0 & \text{otherwise} \end{cases}$$

You're creating a function

$a_b(t) := Amax \cdot \sin(\omega_f \cdot t) \cdot (t \le tpulse)$



$i := 0, 1 .. 2000 \qquad fn_i := i \qquad \zeta := 0$

$$SRS_i := \left\| \begin{array}{l} w_i \leftarrow 2 \cdot \pi \cdot fn_i \\ \max\left[\left| \frac{w_i}{\sqrt{1-\zeta^2}} \cdot \int_0^t a_b(t) \cdot e^{-\zeta \cdot w_i \cdot (t-\tau)} \cdot \sin\left[w_i \cdot \sqrt{\left(1-\zeta^2\right)} \cdot (t-\tau)\right] d\tau \right|\right] \end{array} \right.$$

$$\frac{2000}{2 \cdot \pi} = 318.31$$

$$i := 0 .. 3200 \qquad \omega n_i := \frac{i}{10} \cdot Hza \qquad \zeta := 0$$

I'm not sure exactly what you're trying to do here, but since $\zeta = 0$ this can be simplified. The problem with the code above is that t is not defined; it is supposed to be the end point of your integration by τ

The most direct and intuitive way to generate an SRS from a shock waveform is the following procedure:[2]

Pick a damping ratio (or equivalently, a quality factor Q) for your SRS to be based on;
Pick a frequency f, and assume that there is a hypothetical Single Degree of Freedom (SDOF) system with a damped natural frequency of f;
Calculate (by direct time-domain simulation) the maximum instantaneous absolute acceleration experienced by the mass element of your SDOF at any time during (or after) exposure to the shock in question. This acceleration is a;
Draw a dot at (f,a);
Repeat steps 2–4 for many other values of f, and connect all the dots together into a smooth curve.
The resulting plot of peak acceleration vs test system frequency is called a Shock Response Spectrum. It is often plotted with frequency in Hz, and with acceleration in units of g

$$SRS(\omega, \zeta) := \max\left(\left| \frac{\omega}{\sqrt{1-\zeta^2}} \cdot \int_{0 \cdot s}^{tend} a_b(\tau) \cdot e^{-\zeta \cdot \omega \cdot (tend-\tau)} \cdot \sin\left(\omega \cdot \sqrt{1-\zeta^2} \cdot (tend-\tau)\right) d\tau \right|\right)$$