```matlab
function
[x,phase]=GAT_1st_generation(fs,speed,load,speed_load_plane,speed_axis,load_axis,ratio,
fi_zero)

% OUTPUT:
% x - generated signal
% phase - angular increments in which signal is observed
%
% INPUT:
% fs - sampling frequency [hz]
% speed - rotational speed profile [hz] - length = length(x)
% load - load profile [any units] - length = length(x)
% speed_load_plane - values of the amplitude as a function of speed and load
% speed_axis - speed axis for speed_load_plane [hz]
% load_axis - load axis for speed_load_plane [same units as 'load']
% ratio - angular frequency of signal to be generated [1/rotation]
% fi_zero - initial phase form 0 - 1, [\pi]

N=length(speed);
dt=1/fs;
t=(1:N)*dt;

speed=speed*ratio;

phase=cumsum(speed)*dt+fi_zero;

xn=real(exp(-1i*(2*pi*phase)));

amplitude=interp2(load_axis,speed_axis,speed_load_plane,load,speed,'spline');

x=xn.*amplitude;
```