PM Alternator

PM Generator

Applications
  • Windpower generator
  • Solar power

E1 = 120*\sin(2\pi f t + \phi)
E2 = v*\sin(2\pi f x t + \alpha)

E1 ===== E2

Quick experiment, modeling

\%
\%
f = 60;
f2 = 55;
phi = 60;  \% pi = 180
  \% --- --- = x = \phi(60/180*pi
  \% x \phi
degtorad = \pi/180;

phi = phi * degtorad;
T = 1/f;
dt = T/100;
t = 0:dt:2*T;
E1 = 120*\sin(2\pi f t + \phi);
%En = 10;  Testing case 1
En = 120;
alpha = 30*degtorad;
E2 = En*\sin(2\pi f x t + \alpha);
En = E1 + E2;
%plot(E1, t, E2, t, En, t)
plot(t, E1, t, E2, t, En), grid
Testing Result and Comments:

Parallel Operation
Emergency Operation

- Residential applications
  - AEP power off
  - UPS (200w, battery) => how long, 5 min
  - Emergency generator: 120V, 3kW ($700)

- Business office (backup battery; generator =>)
  - When to start emergency generator? EVENT?