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Appendix:

```
clc
clear
close all
c=135.78;
r=98.02;
l=14.2*10^3;
M=50;
f=1.68*10^9;
n=1;
xline=19.04;
xinter=136.671;
rint=98.02;
xint=xline+2*xinter;
ro=rand(1,1);
xo=rand(1,1);
h=sqrt((ro*xint)/(xo*rint));
k=sqrt((0.4*(rint*xint))/(0.7*(ro*xo)));
zo=sqrt(l/c);
zrep=h*k*zo;
pvia=0.6*10.^-3;
for i=1:M;
x=rand(50,1);
psiload=rand(50,1);
psidesel=rand(50,1);
psiHdin=rand(50,1);
psidrive=rand(50,1);
psislavesel=rand(50,1);
psirepsel=rand(50,1);
psisel=rand(50,1);
psiaddress1=rand(50,1);
psidatasel=rand(50,1);
psinoport=rand(50,1);
psiarb=rand(50,1);
psinextarb=rand(50,1);
psinextdesel=rand(50,1);
psidesel2=rand(50,1);
```

```
%dissipated energy in input stage
Einp=7.78+3.81*psiload+2.6*psidesel+0.96*psiHdin+3.27*psidrive;
%dissipated energy in decoder
Edec=0.47+3.04*psislavesel+2.17*psirepsel+0.13*psiHdin+0.38*psisel;
%dissipated energy in output stage
Eout=0.72+2.61*psiaddress1+1.53*psidatasel+0.14*psiHdin+1.48*psinoport;
%dissipated energy in arbiter
Earb=0.65+(0.76+n*0.3)*psiarb+0.6*psinextarb+(0.34+n*0.48)*psidesel2+0.52*psi
nextdesel;
%dissipated energy in wire
D=((x*((r*sqrt(c*((2*l)-c*r^3))+sqrt(c*r))/((1-c)*r^2))));
G=(r*c)^2*((c*(2*l-c*r^2))/(r^2+sqrt(c*(2*(l-c)*r^2))));
If (Einp < 13){
Ewire=(G*exp(-D))*10^-12;
} else {
vdd=1.1;
vd=vdd.^2;
pi=randi(20,[50,1]);
vri=rand(50,1);
prep=zrep*vd*f*pi*50+pvia*vri;
pvias=pvia*10;
psw=rand(50,1);
ptotalinwire=(psw+prep+pvias)*10.^-17;
}
}
avgEarb=mean(Earb);
avgEinp=mean(Einp);
avgEdec=mean(Edec);
avgEout=mean(Eout);
avgEwire=mean(Ewire);
avgpowertotalwire=mean(ptotalinwire);
powercomparison=[avgEarb;avgEinp;avgEdec;avgEout;real(avgEwire)];
end
```

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