# Optimize Discretization

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[nhinc,nwinc]=optimize_discr(w,h,rh,rw,delta)

Optimizes the discretization of the conductors leaving delta as the smallest filament Returns the discretization values nhinc and nwinc rh,rw is the relation of height and width of following filaments

# Parameters

- @param **w** Width of conductor
- @param **h** Height of conductor
- @param **rh** Height relation of Following Filaments
- @param **rw** Weight relation of Following Filaments
- @param **delta** Skin effect
- @retval **nhinc** Number of Height Filaments
- @retval **nwinc** Numer of Weight Filaments

# Code

```
function [nhinc,nwinc]=optimize_discr(w,h,rh,rw,delta)
 nhinc=optimize_size(h,rh,delta);
 nwinc=optimize_size(w,rw,delta);

%mu0=4*pi*1e-7;
%freq=500e3;
%skin=sqrt(2*(1/5.8e7)/(2*pi*freq*mu0));

%%Auxiliar Function
function [nwinc]=optimize_size(w,rw,delta)

 sum=0;
 if delta<w %No need to discretizate the cable
  for nwinc=2:2:100 %Maximum allowed discretization 100x100
   sum=sum+2*rw^((nwinc-2)/2)*delta; %nwinc even
   if sum>=w
    break;
   end
```

```
  aux=sum+rw^(nwinc/2)*delta; %nwinc odd
  if aux>=w
   nwinc=nwinc+1;
   break;
  end
 end
else
 nwinc=1;
end
```

# Discretization

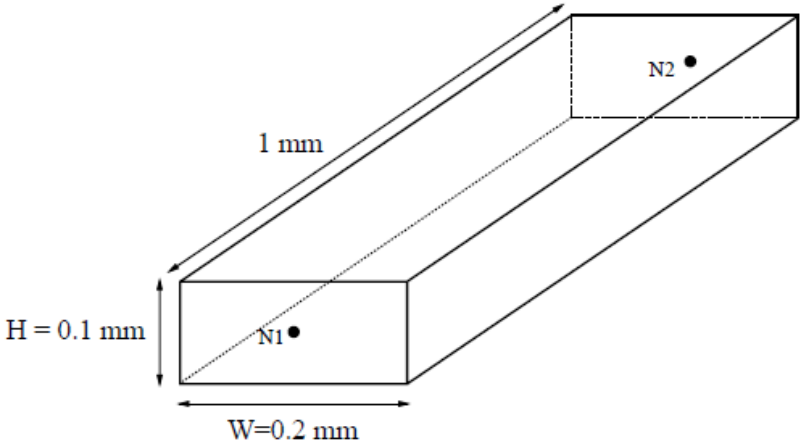



Figure 1: Example Segment for Sample Input File

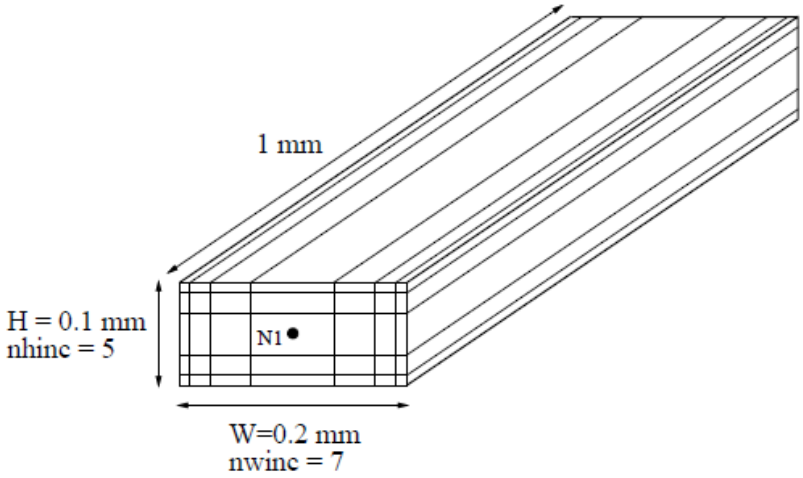
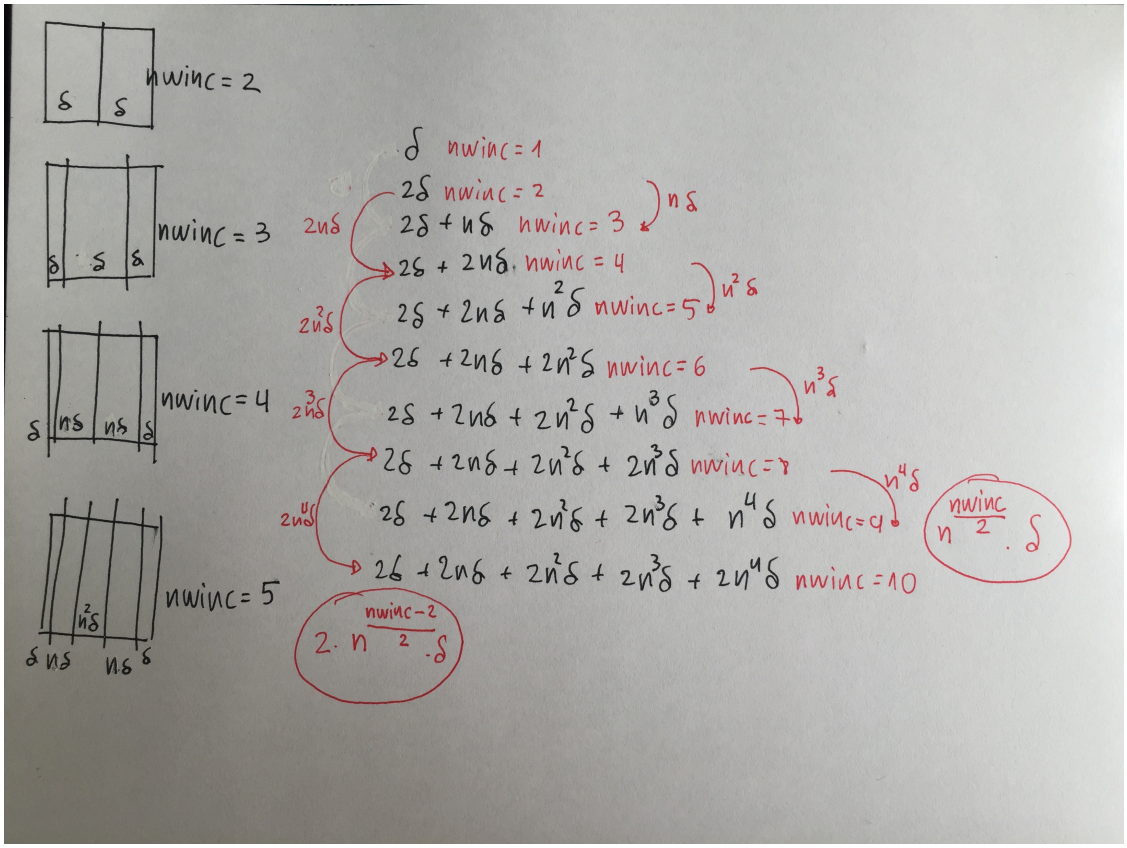



Figure 2: Segment discretized into 35 filaments

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