first data point

inputs

In[584]:= **neT = nearr[[1]]**

Out[584]= 1.80757×10^{18}

In[585]:= **ψT = ψedge[[1]]**

Out[585]= 1.60164

In[588]:= **VlayerT = Vlayer[[1]]**

Out[588]= 0.00114254

In[586]:= **zT = zarr[[1]]**

Out[586]= −0.15

In[587]:= **θ1T = θ1arr[[1]]**

Out[587]= 0

In[589]:= **B0T = B0[[1]]**

Out[589]= 0.0707731

In[591]:= **te = 5**

Out[591]= 5

In[592]:= **mu = 2**

Out[592]= 2

In[593]:= **zz = 1**

Out[593]= 1

In[595]:= **ω = 13.56 * 10^6 * 2 π**

Out[595]= 8.52×10^{7}

In[608]:= **ddSI = 0.005**

Out[608]= 0.005

In[613]:= **ϵ0SI = 8.8542 * 10^-12**

Out[613]= 8.8542×10^{-12}

calculations

In[664]:= `λdeSI = 743. * Sqrt[te / (neT * 10^-6)] * 0.01`

Out[664]= 0.0000123574

In[599]:= `ωpi = 1.32 × 10^3 zz Sqrt[(neT * 10^-6) / mu]`

Out[599]= 1.25489×10^{9}

In[600]:= `Ωi = 9580. zz B0T * 10^4 / mu`

Out[600]= 3.39003×10^{6}

In[601]:= `ωhat = ω / ωpi`

Out[601]= 0.0678943

In[602]:= `Ωhat = Ωi / ωpi`

Out[602]= 0.00270145

In[603]:= `bnT = Abs[Cos[ψT]]`

Out[603]= 0.0308429

In[604]:= `ξT = VlayerT / te`

Out[604]= 0.000228508

In[606]:= `{ωhat, Ωhat, bnT, ξT}`

Out[606]= {0.0678943, 0.00270145, 0.0308429, 0.000228508}

In[657]:= `yhatT = ytot[ωhat, Ωhat, bnT, ξT]`

Out[657]= 0.0335034 − 0.02503 i

In[667]:= $\epsilon rel = -\frac{Im[yhatT]}{\omega hat}\,\frac{ddSI}{\lambda deSI}$

Out[667]= 149.166

In[670]:= $\sigma SI = \epsilon 0SI\ \omega pi\ \frac{ddSI}{\lambda deSI}\ Re[yhatT]$

Out[670]= 0.150622

details of ytot calculation

In[756]:= `{ωhat, Ωhat, bnT, ξT}`

Out[756]= {0.0678943, 0.00270145, 0.0308429, 0.000228508}

In[752]:= `ff[ξT, 0]`

Out[752]= 3.18513

In[753]:=
```
gg[ωhat]
```
Out[753]= 0.976065

In[754]:=
```
phi0avg[ωhat, ξT, 0]
```
Out[754]= 3.18513

In[757]:=
```
niwω[ωhat, Ωhat, bnT, ξT, 0]
```
Out[757]= 0.0863721

In[768]:=
```
niωpars = {k0 → 3.7616962640756197`, k1 → 0.2220204461728174`};
phiavg = phi0avg[ωhat, ξT, 0];
philowω = k0 + k1 (ξT - k0) - Log[1 - 0 / upar0] /. niωpars;
phimod = philowω + (phiavg - philowω) Tanh[ωhat]
```
Out[771]= 2.9441

In[775]:=
```
Re[niw[Ωhat, bnT, phimod]]
```
Out[775]= 0.0863721

In[776]:=
```
yd[ωhat, Ωhat, bnT, ξT, 0]
```
Out[776]= 0. - 0.0125685 i

In[778]:=
```
he[ξT]
```
Out[778]= 0.999996

In[777]:=
```
ye[bnT, ξT, 0]
```
Out[777]= 0.0326021

In[779]:=
```
yi[ωhat, Ωhat, bnT, ξT, 0]
```
Out[779]= 0.000901283 - 0.0124615 i

In[780]:=
```
ytot[ωhat, Ωhat, bnT, ξT, 0]
```
Out[780]= 0.0335034 - 0.02503 i