SPACE APPLICATION NOTE
WHY I THINK THAT GREEN'S FUNCTIONS FOR CAPACITANCE CALCULATIONS DRAFT ARE INCORRECT

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1. EXPLANATION

See page 2-3 of the Draft the formules for the image strengths Si and positions Zi below Equation (2.10), which must be equal to the SPACE greenSeries(0,3,1,1):

```
images.h:
---------

greenSeries (0, 3, 1, 1) {
    n = p(0) - p(2);
    u = p(0) + p(2);
    m = p(1) + p(2);
    S = k(1,u+1)*k(2,m)/e(1);
    image(-S,-2*t(1)*(n+1) - 2*t(2)*(m),-1); /*1*/
    image(-S, 2*t(1)*(n+1) + 2*t(2)*(m),-1); /*2*/
    image( S,-2*t(1)*(n+1) - 2*t(2)*(m), 1); /*3*/
    image( S, 2*t(1)*(n+1) + 2*t(2)*(m), 1); /*4*/
    S = k(1,u)*k(2,m+1)/e(1);
    image(-S,-2*t(1)*(n) - 2*t(2)*(m+1),-1); /*5*/
    image(-S, 2*t(1)*(n) + 2*t(2)*(m+1),-1); /*6*/
    image( S,-2*t(1)*(n) - 2*t(2)*(m+1), 1); /*7*/
    image( S, 2*t(1)*(n) + 2*t(2)*(m+1), 1); /*8*/
}
```

```
zq_sign=-1: R.z = Zp - Zq + distance; Zi = +Zq - distance;
zq_sign=+1: R.z = Zp + Zq + distance; Zi = -Zq - distance;
(R.z = Zp - Zi;  -> R.z - Zp = -Zi;)
```

```
H1=2*t(1)
H2=2*t(2)
```

```
image1: Si = -K12^(u+1)*K23^(m); Zi =  Zq + H1*(n+1) + H2*(m);
image2: Si = -K12^(u+1)*K23^(m); Zi =  Zq - H1*(n+1) - H2*(m);
image3: Si =  K12^(u+1)*K23^(m); Zi = -Zq + H1*(n+1) + H2*(m);
image4: Si =  K12^(u+1)*K23^(m); Zi = -Zq - H1*(n+1) - H2*(m);
image5: Si = -K12^(u)*K23^(m+1); Zi =  Zq + H1*(n)   + H2*(m+1);
image6: Si = -K12^(u)*K23^(m+1); Zi =  Zq - H1*(n)   - H2*(m+1);
image7: Si =  K12^(u)*K23^(m+1); Zi = -Zq + H1*(n)   + H2*(m+1);
image8: Si =  K12^(u)*K23^(m+1); Zi = -Zq - H1*(n)   - H2*(m+1);
```

I must conclude that the formules must be:

```
           Si                   Zi
-------------------------------------------------------------
 -K12^(1-k+l+n)*K23^k       Zq - 2*(-1+k+l-n)*h1 + 2*k*h2
 -K12^(1-k+l+n)*K23^k       Zq + 2*(-1+k+l-n)*h1 - 2*k*h2
  K12^(1-k+l+n)*K23^k      -Zq - 2*(-1+k+l-n)*h1 + 2*k*h2
  K12^(1-k+l+n)*K23^k      -Zq + 2*(-1+k+l-n)*h1 - 2*k*h2
 -K12^(-k+l+n)*K23^(1+k)    Zq - 2*(k+l-n)*h1 + 2*(1+k)*h2
 -K12^(-k+l+n)*K23^(1+k)    Zq + 2*(k+l-n)*h1 - 2*(1+k)*h2
  K12^(-k+l+n)*K23^(1+k)   -Zq - 2*(k+l-n)*h1 + 2*(1+k)*h2
  K12^(-k+l+n)*K23^(1+k)   -Zq + 2*(k+l-n)*h1 - 2*(1+k)*h2
-------------------------------------------------------------
```