

ECEN5154: Homework #4 – *due 4-16-20 (2pm)*

1. Consider a small $0.1\lambda_0$ long center-fed dipole of radius $a=10^{-4}\lambda_0$. Using the Galerkin's subsectional sinusoidal basis solution, it is found that the impedance matrix (with 4 segments \rightarrow 3PWS) is given by:

$$Z_{12} = Z_{21} = Z_{23} = Z_{32} = -0.493889 - j1577.1$$

$$Z_{13} = Z_{31} = -0.490242 - j132.354$$

$$Z_{11} = Z_{22} = Z_{33} = -0.495107 + j3426.99$$

- (a) For a delta gap excitation determine the input impedance using the four segments tessellation.
- (b) How many subdivisions are needed to reach the value of $Z_{in} = 1.837 - j1895 \Omega$?
- (c) Find the converged value of Z_{in} for a magnetic frill excitation.
- (d) What do you get in FEKO or HFSS or other commercially available CEM tool (please state what tool you used)?