**Simulations**

1. **Wave propagation characteristics:**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ρ=100, εr=15 (Carson) | LS, ρ=104.8  (Carson) | Cigre, ρ=100  (Carson) | ρ=100, εr=15 (Wise) | LS, ρ=104.8  (Wise) | Cigre, ρ=100  (Wise) |
| ρ=1000, εr=5  (Carson) | LS, ρ=1097  (Carson) | Cigre, ρ=1000  (Carson) | ρ=1000, εr=5  (Wise) | LS, ρ=1097  (Wise) | Cigre, ρ=1000  (Wise) |
| ρ=10000, εr=3  (Carson) | LS, ρ=11924  (Carson) | Cigre, ρ=10000  (Carson) | ρ=10000, εr=3  (Wise) | LS, ρ=11924  (Wise) | Cigre, ρ=10000  (Wise) |

1. **Ratios of wave propagation characteristics:**
2. **Transient responses**

**Paper Structure**

1. Intro
2. Formulation
   1. Impedance and admittance
   2. Soil models
3. Propagation characteristics
   1. Modal analysis
   2. Effect of earth admittance correction (Comparison of constant parameter results)
   3. Effect of soil modelling
4. Responses
   1. Frequency domain (see Energies and Kopsidas)
   2. Transients

Configuration (see Kopsidas): OHL (terminated), pipeline (terminated)

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Length (see Kopsidas) | 100 m | 500 m | 1000m | 5000m | 10000m |
| Switching (250/2500) |  |  |  |  |  |
| Lightning (1.2/50) |  |  |  |  |  |

1. Conclusions