Receiving End Voltage: CP Line (3 phase energize)
Sending End Current: CP Line (3 phase energize)

Receiving End Voltage: FD Line (3 phase energize)
Sending End Current: 
FD Line (3 phase energize)

Compare Receiving End 
Voltages (3 phase energize)
Compare Sending End Currents (3 phase energize)

CP Line Receiving End Voltages (1 phase energize)
FD Line Receiving End
Voltages (1 phase energize)

CP Line Sending End
Currents (1 phase energize)
FD Line Sending End
Currents (1 phase energize)

Compare Receiving End
Voltages (1 phase energize)
Compare Sending End Currents (3 phase energize)

Exmpl18.pl4:
\[ c:VSA \ -VSENDA \]

```
40 45 50 55 60 65
-800 -460 -120 220 560 900
[ms]
```

Compare CP/FD Line Receiving End Voltages (3 phase energize)
60Hz based parameters

Exmpl18f d.pl4:
\[ c:VSA \ -VSENDA \]

```
45 49 53 57 61 65
-800 -460 -120 220 560 900
[kV]
```

(file L30FDline.pl4; x-var t)
\[ v:VREFDA \]
\[ v:VRECPA \]
Compare CP/FD Line Receiving End Voltages (3 phase energize)
1000Hz based parameters

(file L30FDline.pl4; x-var t) v:VREFDA v:VRECPA

Compare CP/FD Line Receiving End Voltages (3 phase energize)
60Hz based parameters

(file L30FDline.pl4; x-var t) v:VREFDA v:VRECPA

Spring 2018
Compare CP/FD Line Sending End Currents (3 phase energize)

1000Hz based parameters

```
(c:VSRCA -VSEFDA)
(c:VSRCA -VSENDA)
```

60Hz based parameters

```
(c:VSRCA -VSEFDA)
(c:VSRCA -VSENDA)
```
Compare CP/FD Line Receiving End Voltages (1 phase energize)
1000Hz based parameters

---

Compare CP/FD Line Receiving End Voltages (1 phase energize)
60Hz based parameters

---

Spring 2018
Compare CP/FD Line Sending End Currents (1 phase energize)
1000Hz based parameters

Compare CP/FD Line Sending End Currents (1 phase energize)
with 60 Hz based parameters
**FD Line in PSCAD/EMTDC**

```
R=0
Tline
CP line, 100km
```

```
BRK1
Timed Breaker Logic
Open@t0
```

```
BRK2
Timed Breaker Logic
Open@t0
```

```
Vsend CP
Tline
Vrecv CP
```

```
Vsend FD
Tline2
Vrecv FD
```

**EMTDC Line Constants**

**Dialog: two options**

**Frequency Dependent (Phase) Model Options**

- Travel Time Interpolation: On
- Curve Fitting Starting Frequency: 0.5 [Hz]
- Curve Fitting End Frequency: 1.0E6 [Hz]
- Total Number of Frequency Increments: 100
- Maximum Order of Fitting for YSurge: 20
- Maximum Order of Fitting for Prop. Func.: 20
- Maximum Fitting Error for YSurge: 2 [%]
- Maximum Fitting Error for Prop. Func.: 2 [%]

**Frequency Dependent (Mode) Model Options**

- Travel Time Interpolation: On
- Curve Fitting Starting Frequency: 0.5 [Hz]
- Curve Fitting End Frequency: 1.0E6 [Hz]
- Maximum Order of Fitting for ZSurge: 20
- Maximum Order of Fitting for Prop. Func.: 20
- Maximum Fitting Error for ZSurge: 2 [%]
- Maximum Fitting Error for Prop. Func.: 2 [%]
Comparison Results: 3 phase energization, 1000 Hz

Comparison Results: 3 phase energization, 60 Hz
Comparison Results: 3 phase energization, 1000 Hz

Comparison Results: 3 phase energization, 60 Hz