

BusFreq

April 11, 2024

1 BusFreq Parameters

```
[ ]: import andes

import matplotlib.pyplot as plt

[ ]: %matplotlib inline

[ ]: andes.__version__

[ ]: '1.9.1.post30+gcb03c305'

[ ]: ss = andes.load(andes.get_case("ieee14/ieee14_full.xlsx"),
                    verbose=30, setup=False, no_output=True)

ss.add("Toggle", dict(model='SynGen', dev="GENROU_2", t=1.0))
# ss.add("Toggle", dict(model='Line', dev="Line_2", t=1.0))
# ss.add("Toggle", dict(model='Line', dev="Line_6", t=2))

busf_dict = {
    'default': {'Tf': 0.02, 'Tw': 0.02},
    'set1': {'Tf': 0.02, 'Tw': 0.05},
    'set2': {'Tf': 0.02, 'Tw': 0.1},
}

for key, val in busf_dict.items():
    ss.add("BusFreq", dict(idx=key, bus=6, **val))

ss.setup()

[ ]: True

[ ]: ss.GENROU.as_df()

[ ]:
      uid      idx  u  name  bus  gen  coi  coi2  Sn  Vn  fn  ...  \
0      GENROU_1  1.0  GENROU_1  1  1  None  None  100.0  69.0  60.0  ...
1      GENROU_2  1.0  GENROU_2  2  2  None  None  100.0  69.0  60.0  ...
```

2	GENROU_3	1.0	GENROU_3	3	3	None	None	100.0	69.0	60.0	...
3	GENROU_4	1.0	GENROU_4	6	4	None	None	100.0	138.0	60.0	...
4	GENROU_5	1.0	GENROU_5	8	5	None	None	100.0	69.0	60.0	...

	gammaq	xd	xq	xd2	xq1	xq2	Td10	Td20	Tq10	Tq20
uid										
0	1.0	1.8	1.75	0.23	0.8	0.23	6.5	0.06	0.2	0.05
1	1.0	1.8	1.75	0.28	0.8	0.28	6.5	0.06	0.2	0.05
2	1.0	1.8	1.75	0.34	0.8	0.34	6.5	0.06	0.2	0.05
3	1.0	1.8	1.75	0.28	0.8	0.28	6.5	0.06	0.2	0.05
4	1.0	1.8	1.75	0.34	0.8	0.34	6.5	0.06	0.2	0.05

[5 rows x 30 columns]

```
[ ]: ss.PFlow.run()
```

```
ss.TDS.config.criteria = 0
```

```
ss.TDS.run()
```

```
0%|          | 0/100 [00:00<?, ?%/s]
```

```
<Toggle Toggle_1>: SynGen.GENROU_2 status changed to 0 at t=1.0 sec.
```

```
[ ]: True
```

```
[ ]: Tf = ss.BusFreq.get(src='Tf', attr='v', idx=list(busf_dict.keys()))
Tw = ss.BusFreq.get(src='Tw', attr='v', idx=list(busf_dict.keys()))
yheaders = [f'Tf={Tfi}, Tw={Twi}' for Tfi, Twi in zip(Tf, Tw)]
```

```
[ ]: fig, ax = plt.subplots(1, 1, figsize=(8, 5), dpi=100)
right = 6
ss.TDS.plt.plot(ss.GENROU.omega,
                a=(3),
                ytimes=ss.config.freq,
                ylabel='Freq. [Hz]', color='tab:orange',
                line_width=2,
                show=False, grid=True,
                ax=ax, fig=fig, right=right)
ss.TDS.plt.plot(ss.BusFreq.f,
                a=ss.BusFreq.idx2uid(list(busf_dict.keys())),
                ytimes=ss.config.freq,
                ylabel='Bus Freq. [Hz]',
                show=False,
                ax=ax, fig=fig, right=right,
                yheader=yheaders)
```

[]: (<Figure size 800x500 with 1 Axes>,
<Axes: xlabel='Time [s]', ylabel='Bus Freq. [Hz] '>)

