BusROCOF

August 11, 2023

1 BusROCOF: Bus frequency and ROCOF measurement

```
[ ]: import andes
```

```
[ ]: import matplotlib.pyplot as plt
```

```
[ ]: import matplotlib
      %matplotlib inline
```

```
[ ]: andes.__version__
```

```
[ ]: '1.8.10'
```

1.1 Comparing `BusROCOF` with different parameters

```
[ ]: 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("BusROCOF", dict(idx='default', bus=5))
     ss.add("BusROCOF", dict(idx='customized', bus=5, Tw=0.4, Tr=0.1))

     ss.setup()
```

```
[ ]: True
```

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

```
[ ]: True
```

```
[ ]: 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
```

```
[ ]: Tf1 = ss.BusROCOF.get(src='Tf', attr='v', idx='default')
     Tw1 = ss.BusROCOF.get(src='Tw', attr='v', idx='default')
     Tr1 = ss.BusROCOF.get(src='Tr', attr='v', idx='default')

     Tf2 = ss.BusROCOF.get(src='Tf', attr='v', idx='customized')
     Tw2 = ss.BusROCOF.get(src='Tw', attr='v', idx='customized')
     Tr2 = ss.BusROCOF.get(src='Tr', attr='v', idx='customized')

     yheader1 = f'Tf={Tf1}, Tw={Tw1}, Tr={Tr1}'
     yheader2 = f'Tf={Tf2}, Tw={Tw2}, Tr={Tr2}'
```

```
[ ]: fig, ax = plt.subplots(2, 1, figsize=(5, 10))

     vline=[1, 2, 4.2, 10]
     right = 15

     ss.TDS.plt.plot(ss.GENROU.omega,
                     ytimes=ss.config.freq,
                     ylabel='Freq. [Hz]',
                     show=False,
                     ax=ax[0], fig=fig,
                     vline=vline, hline=[59.81],
                     right=right)

     ss.TDS.plt.plot(ss.BusROCOF.Wf_y,
                     ytimes=ss.config.freq,
                     ylabel='Bus RoCoF. [Hz/s]',
                     show=False,
                     ax=ax[1], fig=fig,
                     yheader=[yheader1, yheader2],
                     vline=vline, hline=[-0.14, 0],
                     right=right)
```

```
[ ]: (<Figure size 500x1000 with 2 Axes>,
      <AxesSubplot:xlabel='Time [s]', ylabel='Bus RoCoF. [Hz/s]'>)
```