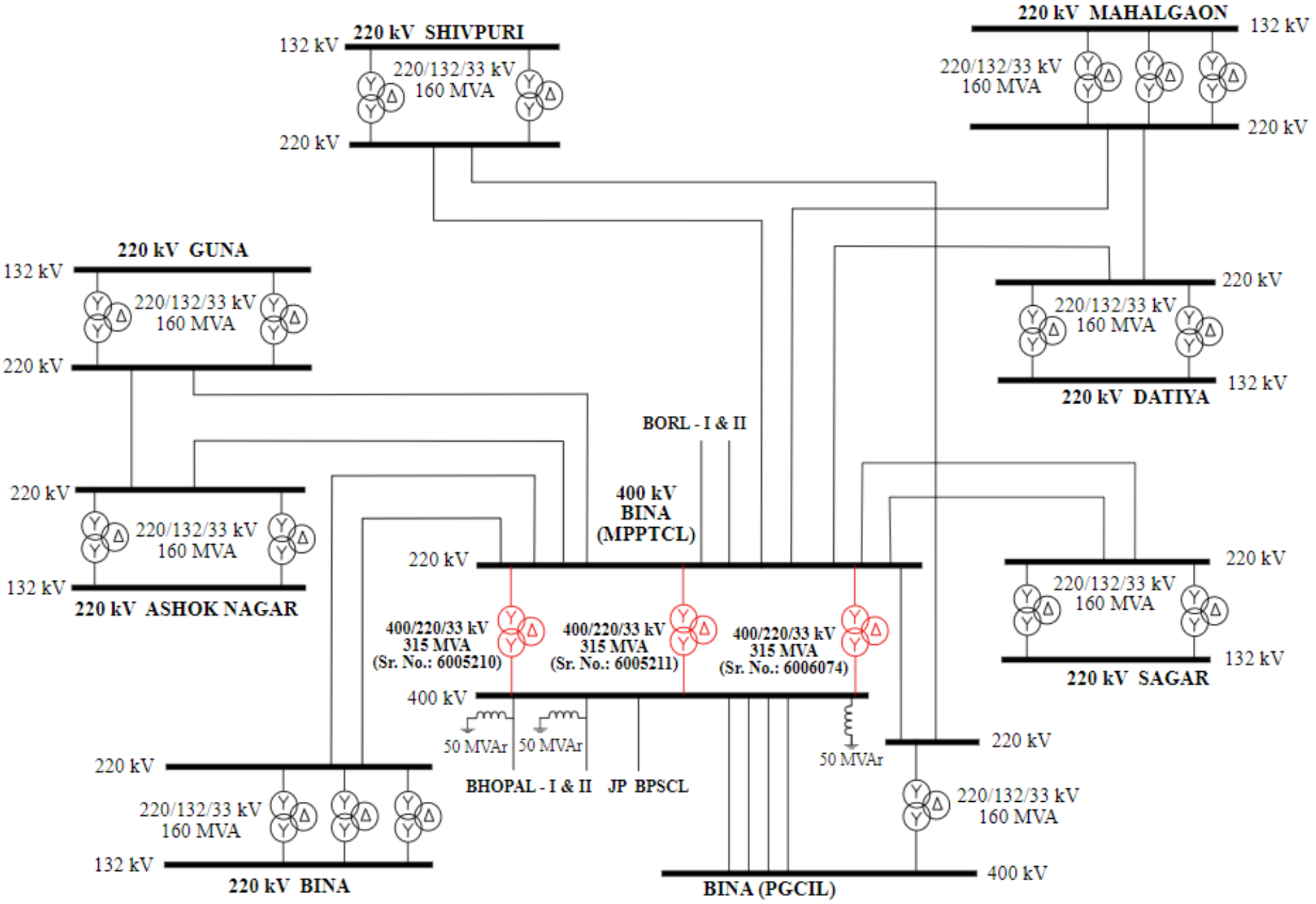
Case studies:

1) Event diagnosis

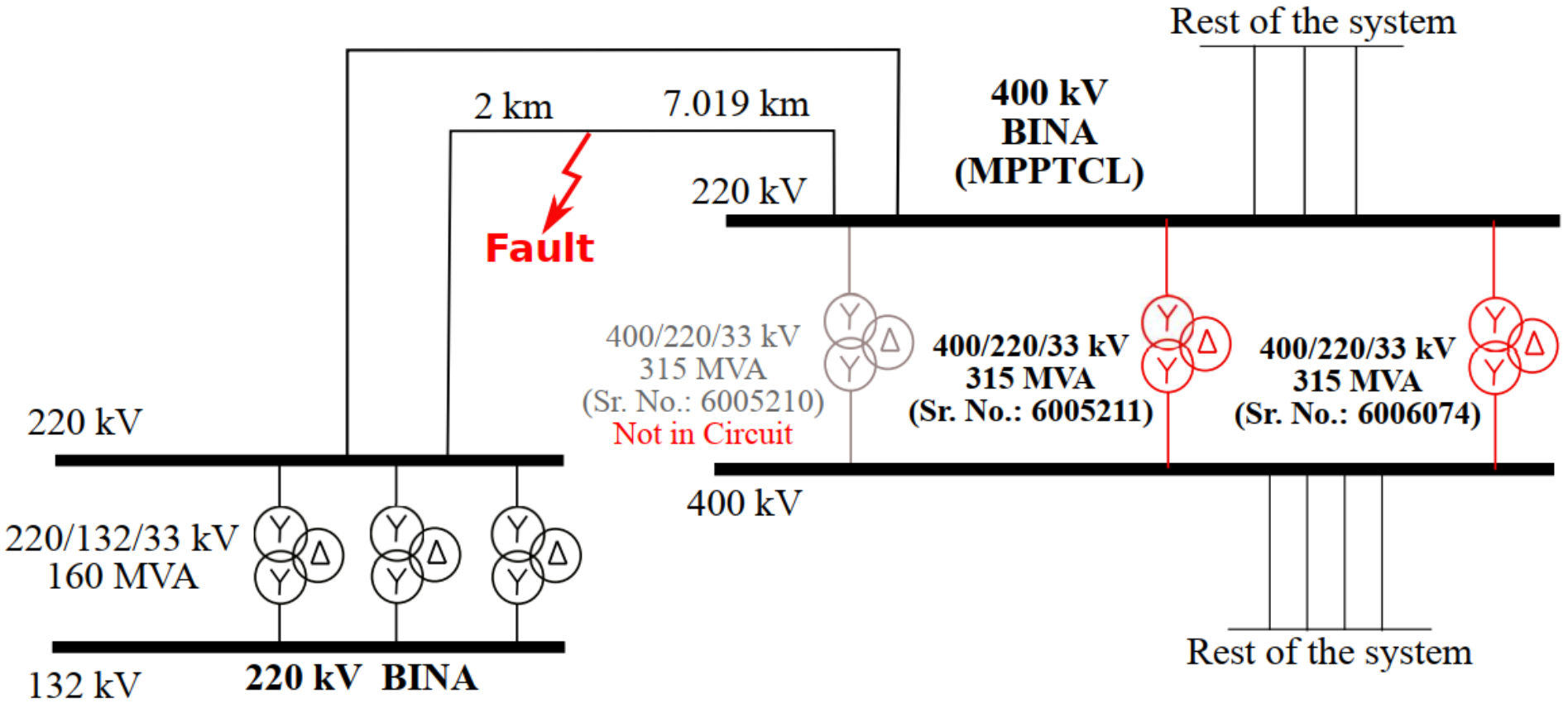
2) Digital Twin

1) Event diagnosis

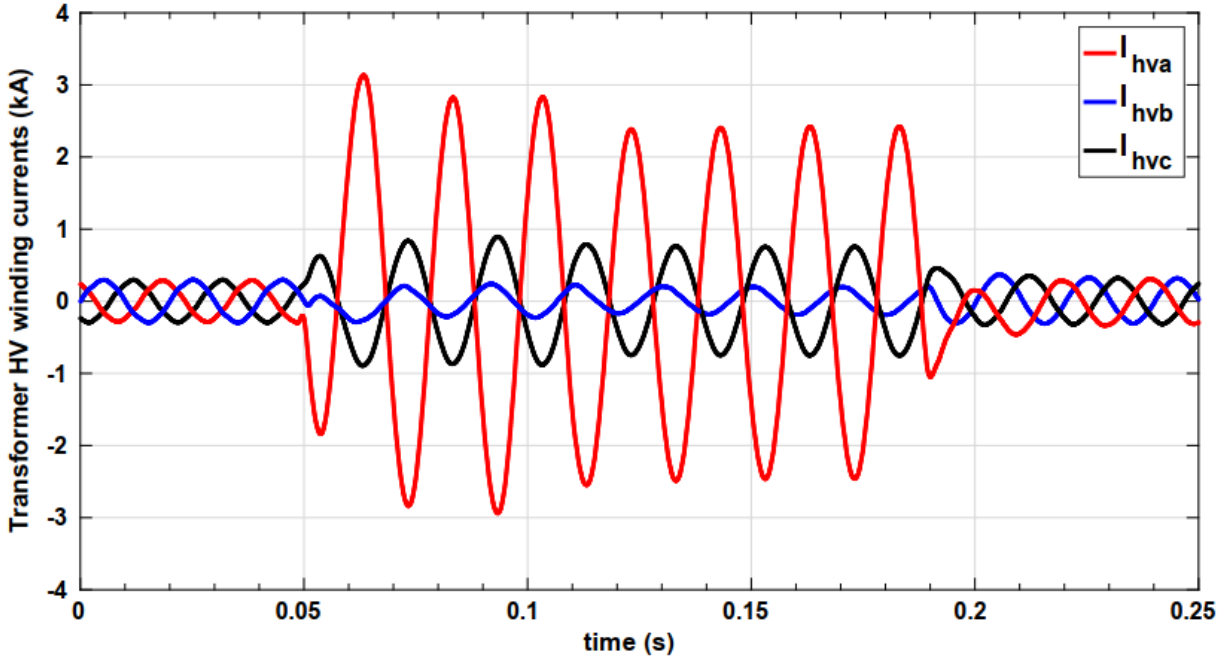


1) Event diagnosis

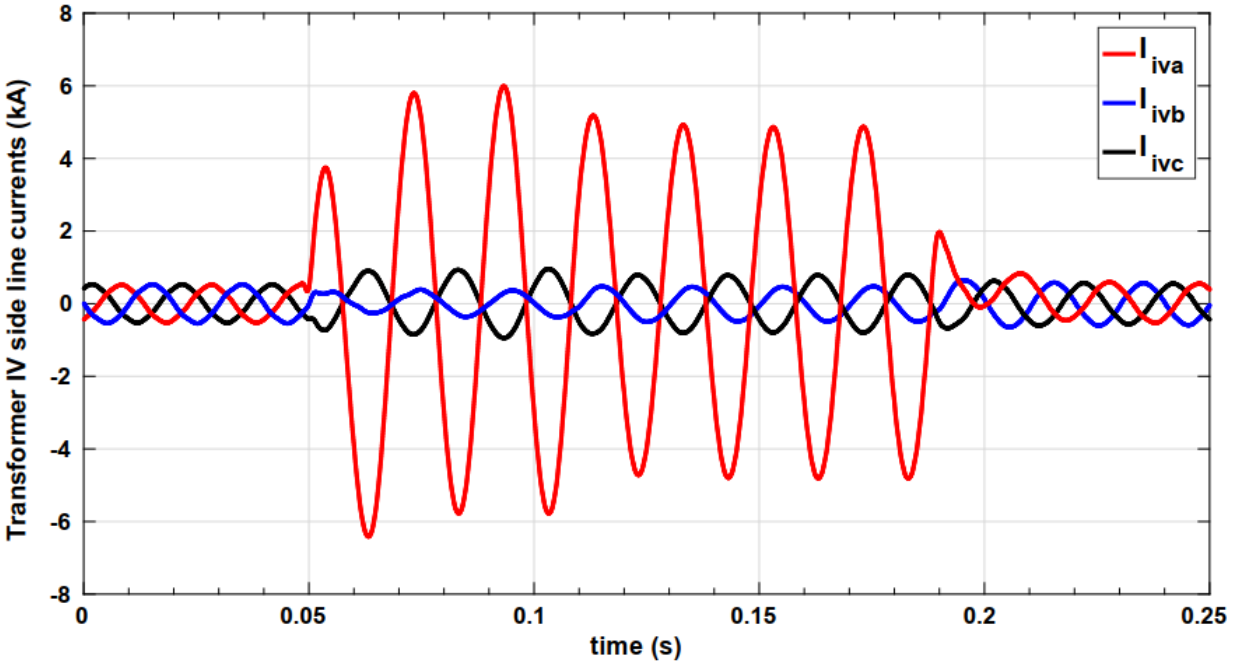
14th February 2018 case



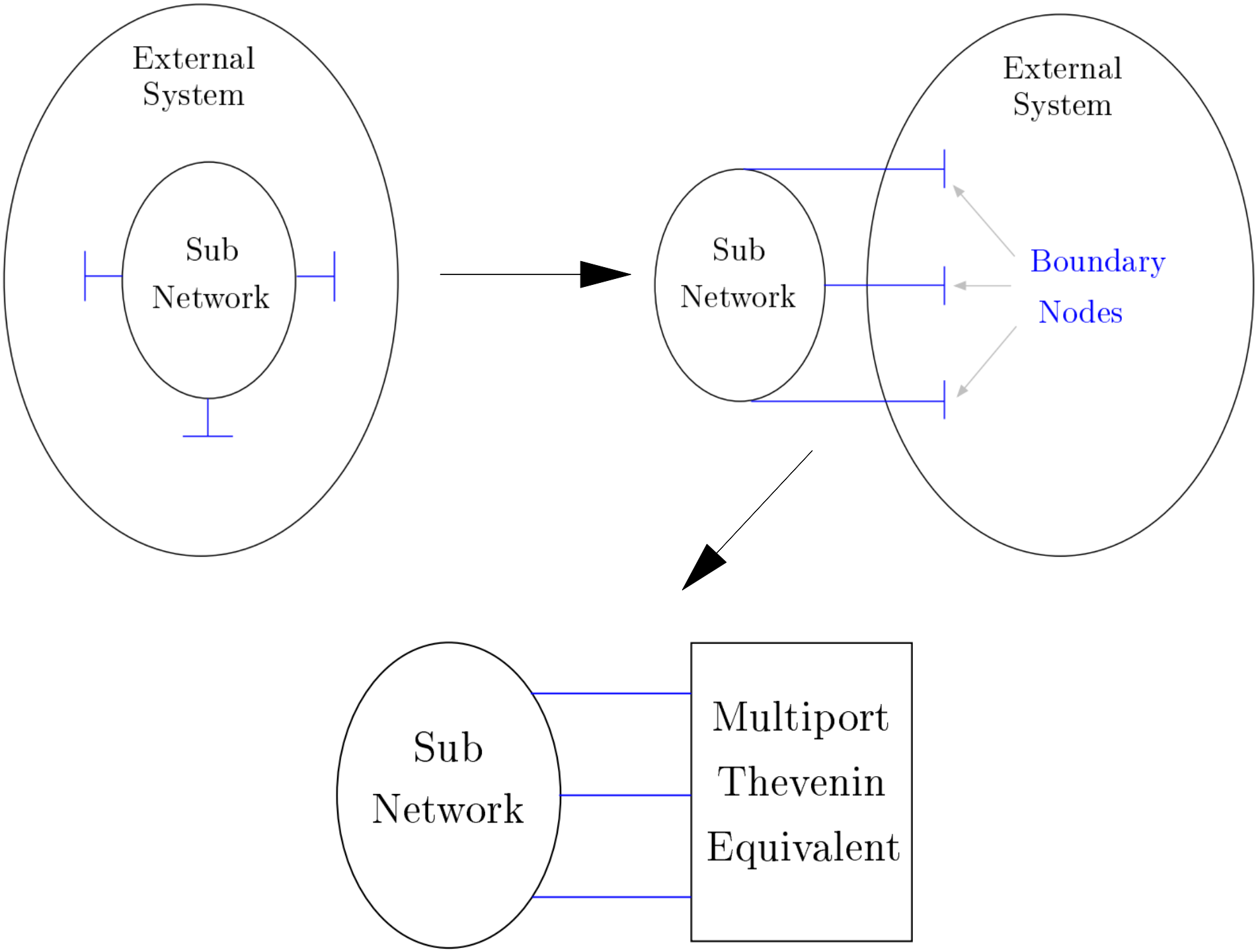
1) Event diagnosis

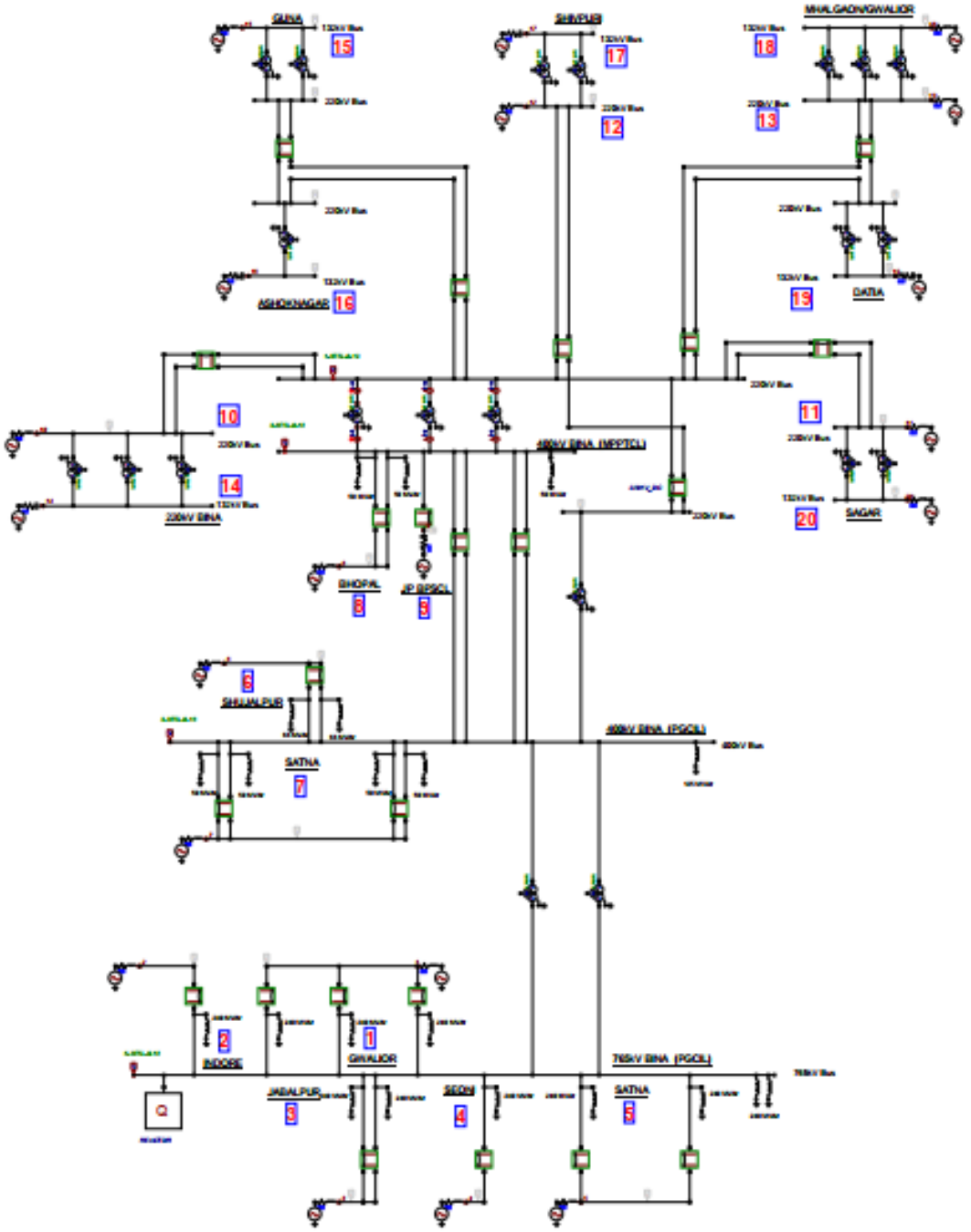


400 kV winding currents
(from disturbance record)



220 kV winding currents
(from disturbance record)

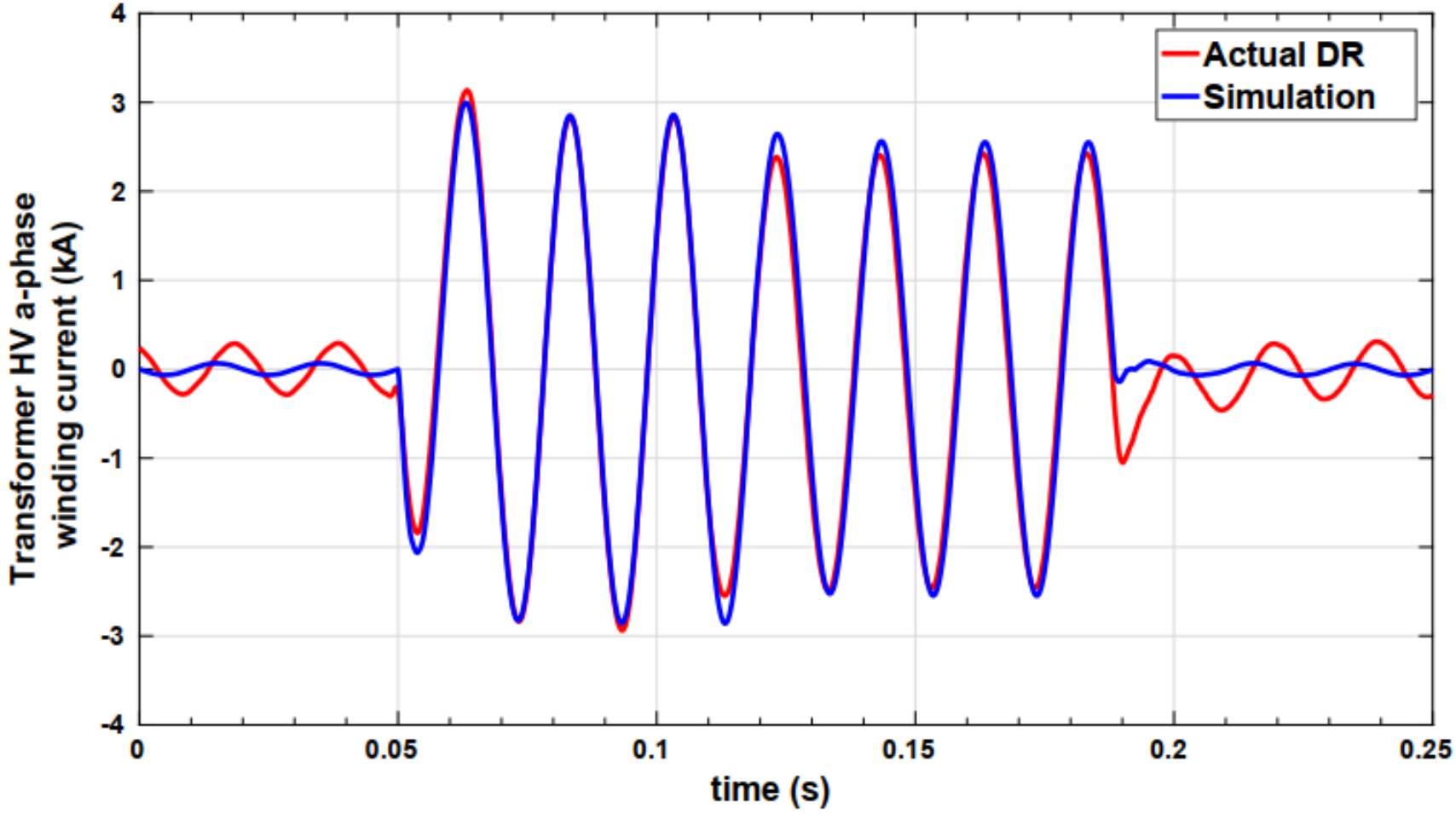

External
System
Sub
Network
External
System
Sub
Network
Boundary
Nodes
Sub
Network
Multiport
Thevenin
Equivalent



MPPTCL simulation with All India system reduced to boundary buses in EMTP-ATP

1) Event diagnosis 14th Feb. 2018 case.

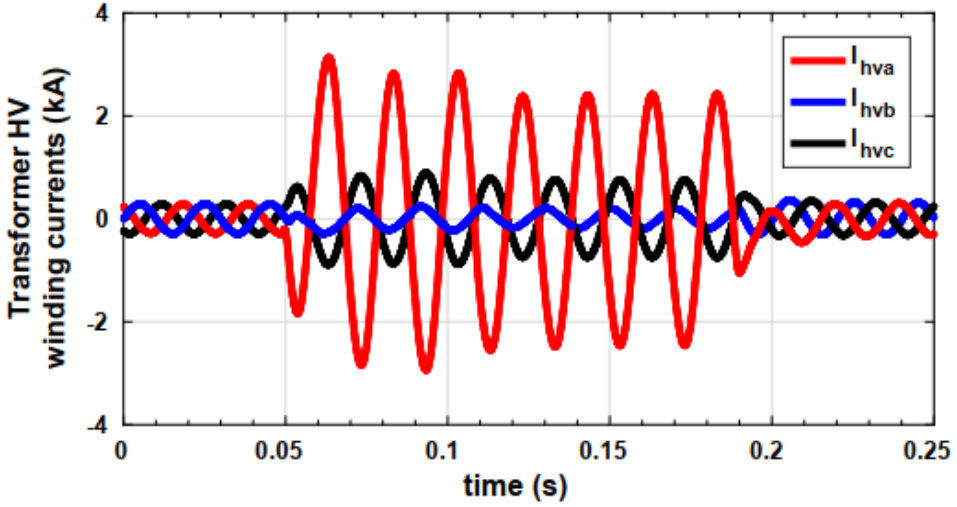
Fault impedance is changed to match the **DR waveform** in fault duration



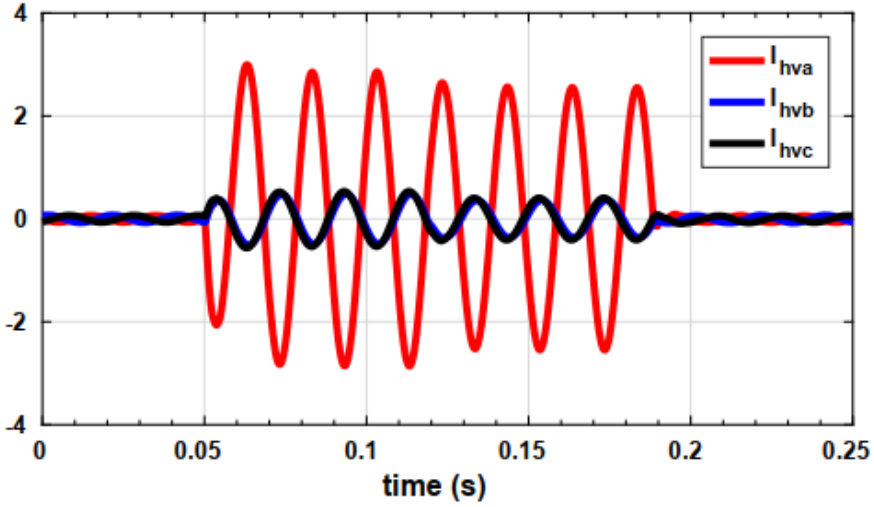
1) Event diagnosis.

400 kV side currents

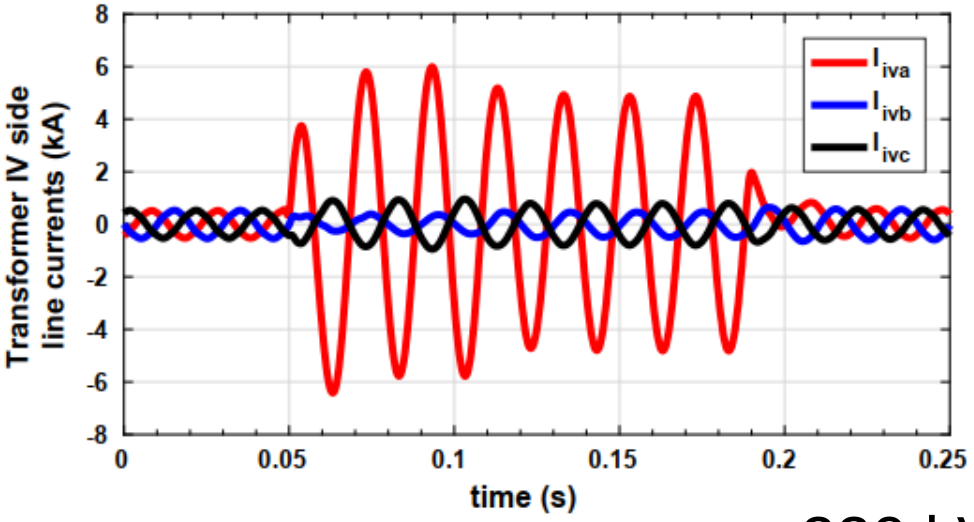
Actual from DR



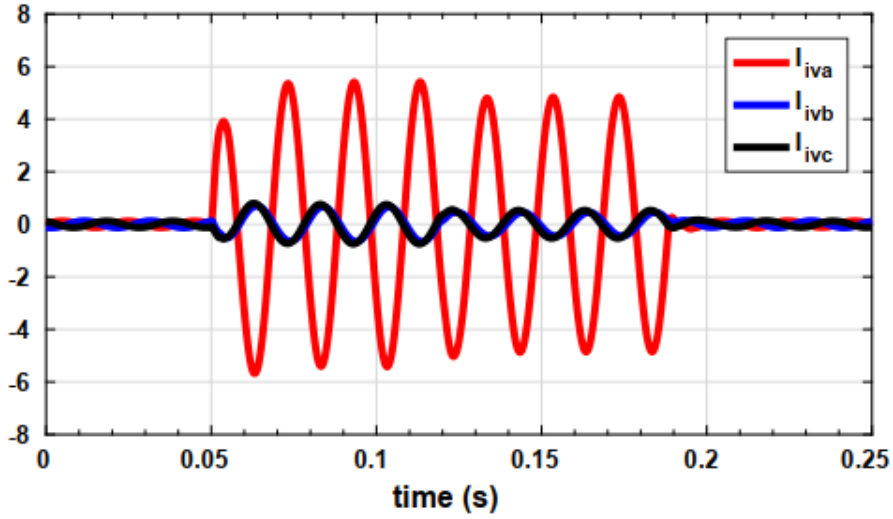
Simulated



Actual from DR

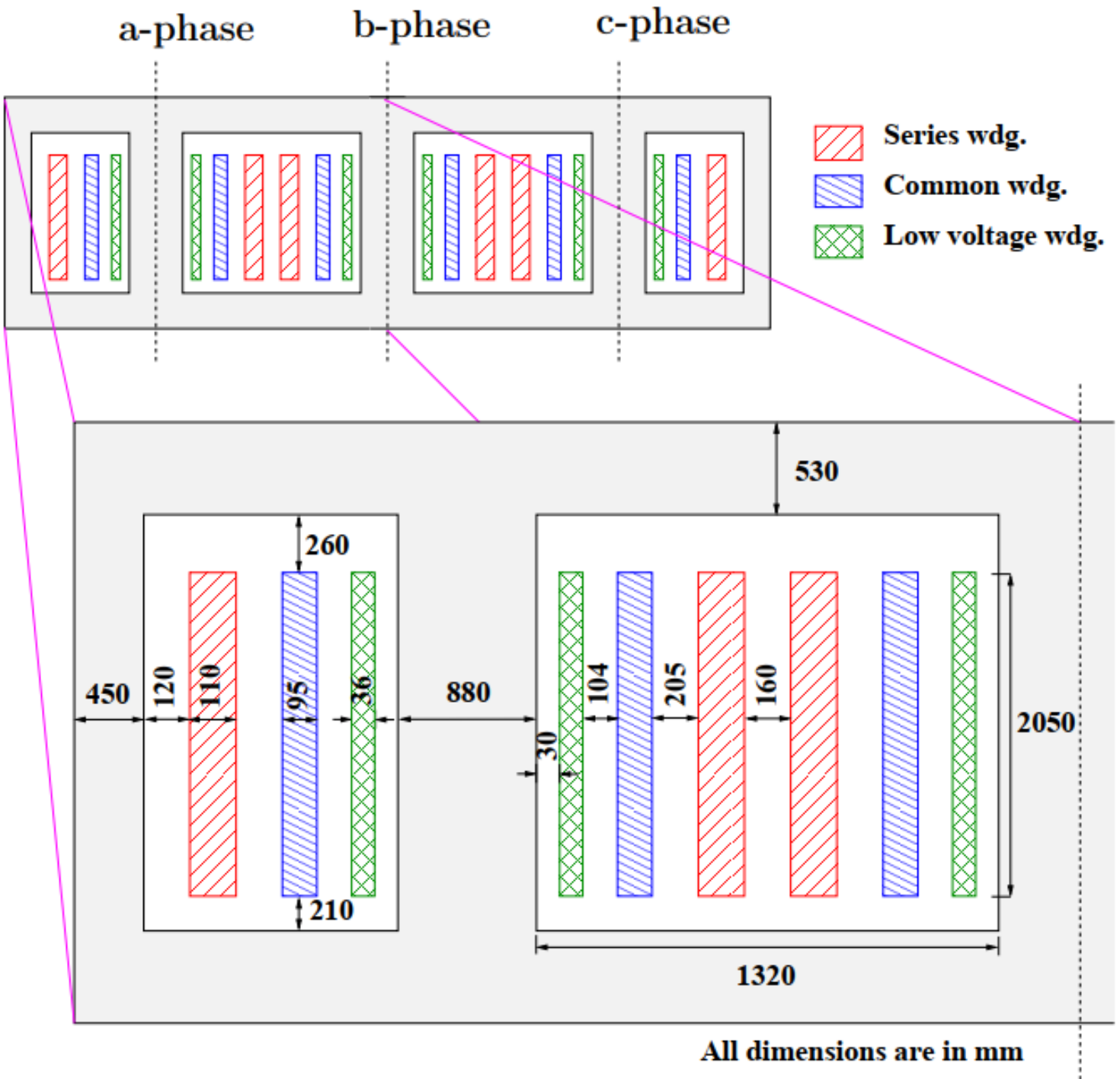


Simulated



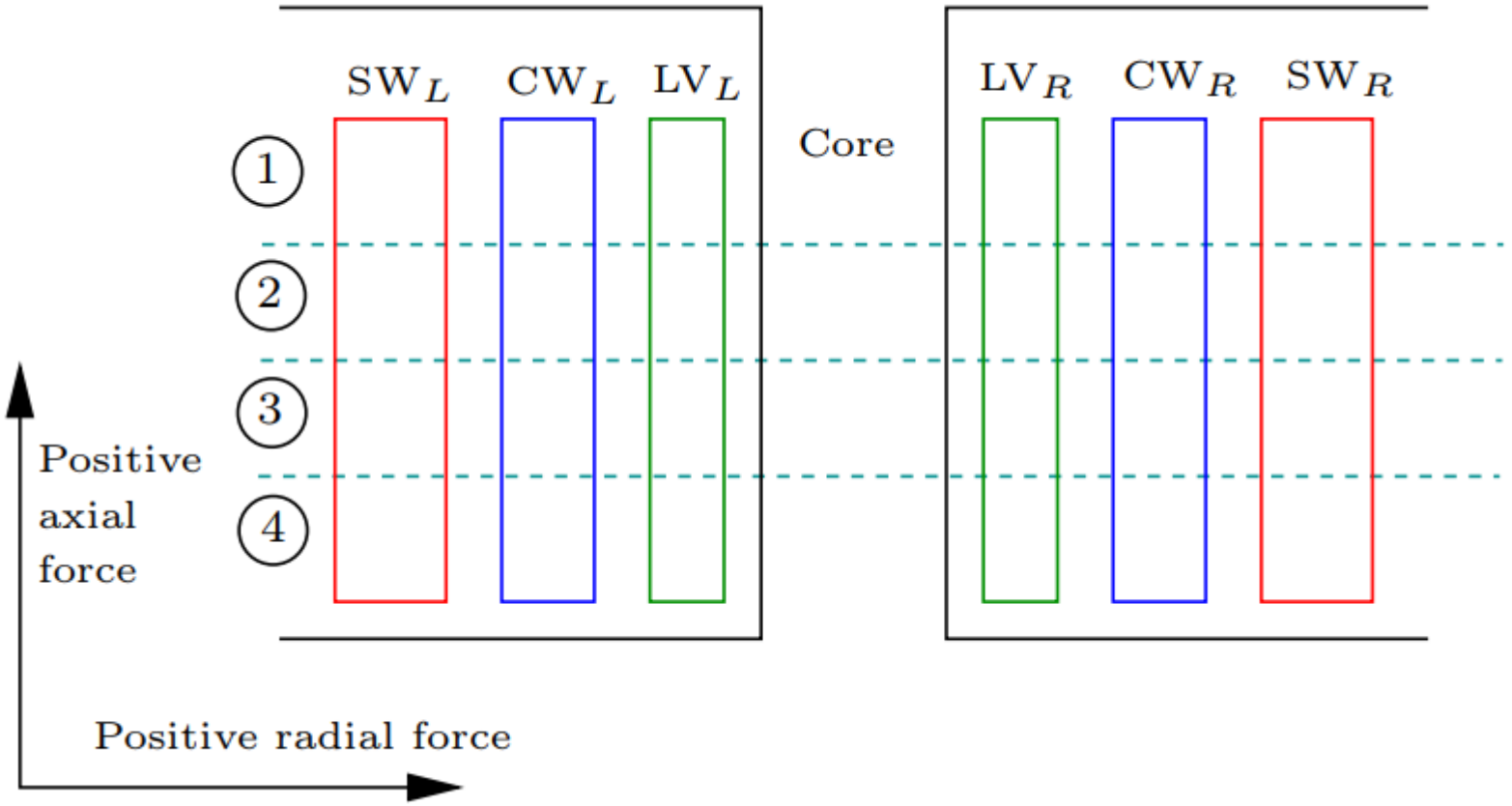
220 kV side currents

2) Digital Twin

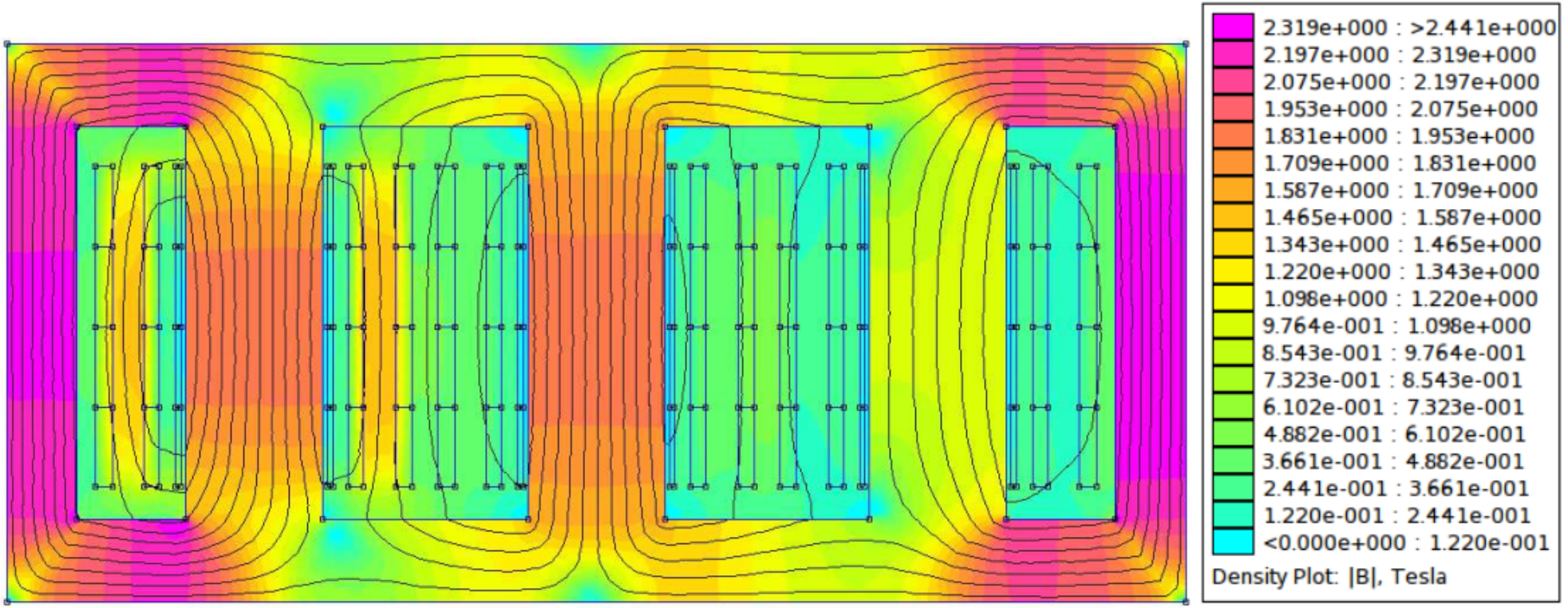


2) Digital Twin

Using series, common and the tertiary winding currents; **the axial and radial stresses** are estimated using Finite Element Method (FEM) package



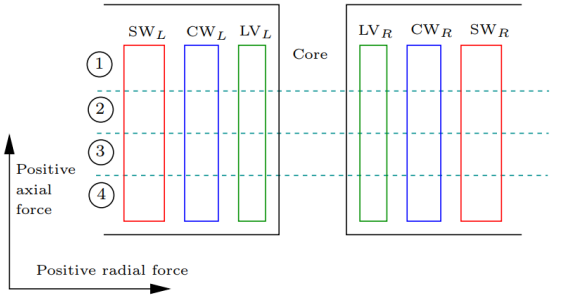
2) Digital Twin

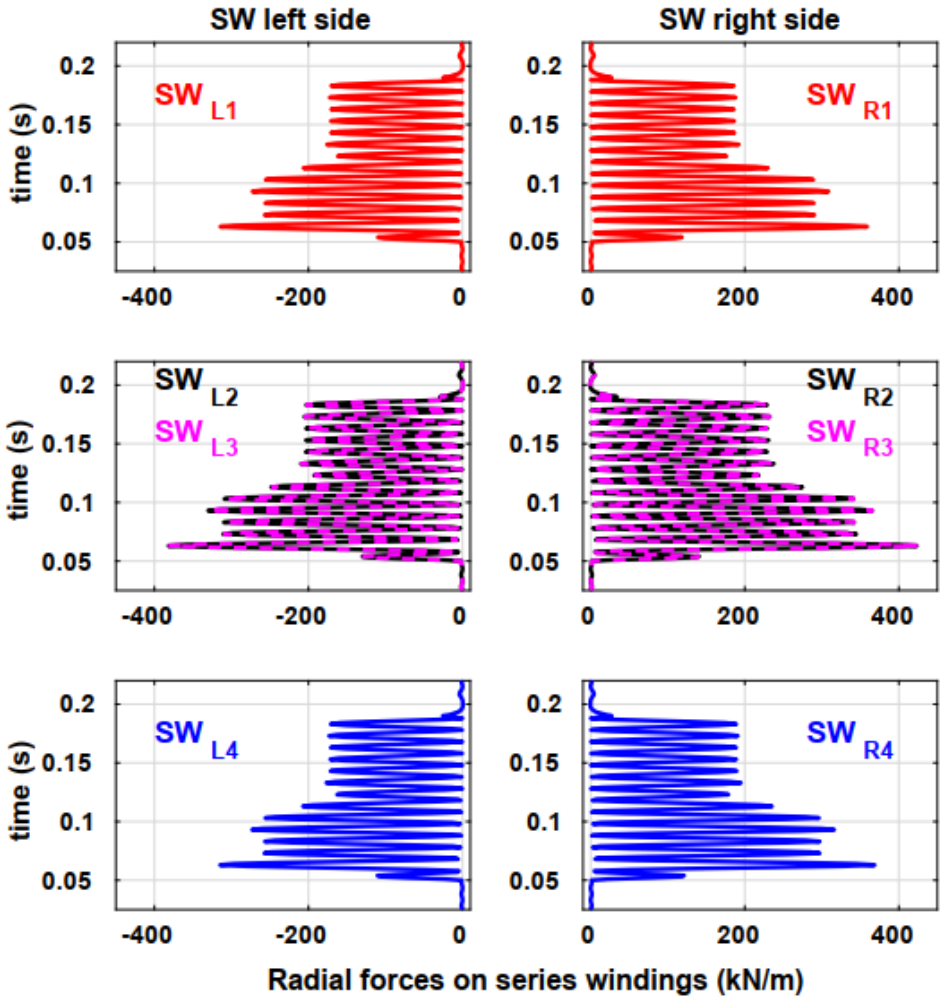


Flux distribution in the transfomer during the fault on 14th February 2018 case.

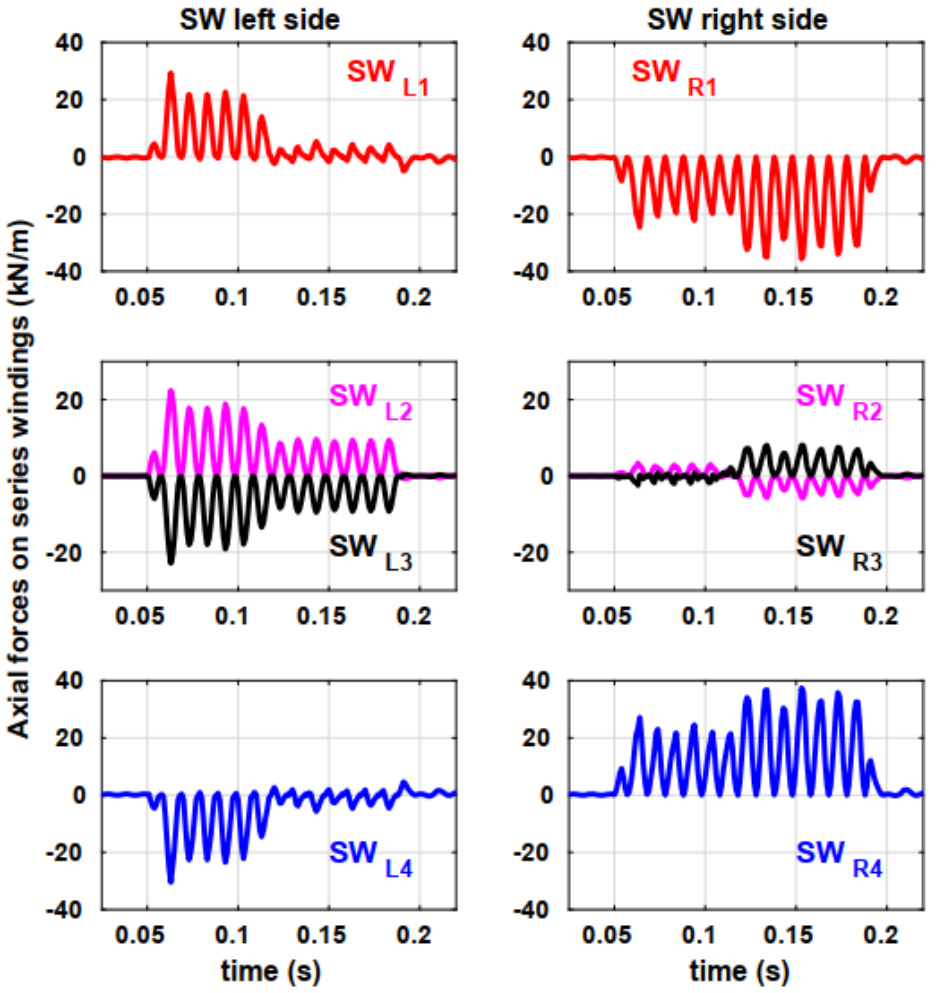
2) Digital Twin

a-phase series winding forces





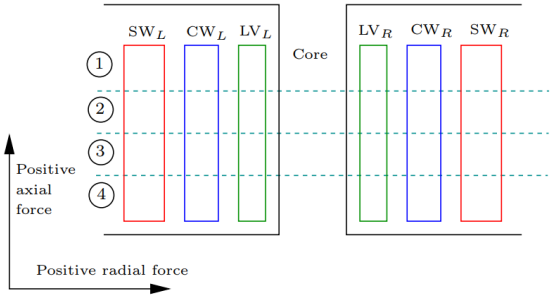
(a) Radial forces on series windings (kN/m).

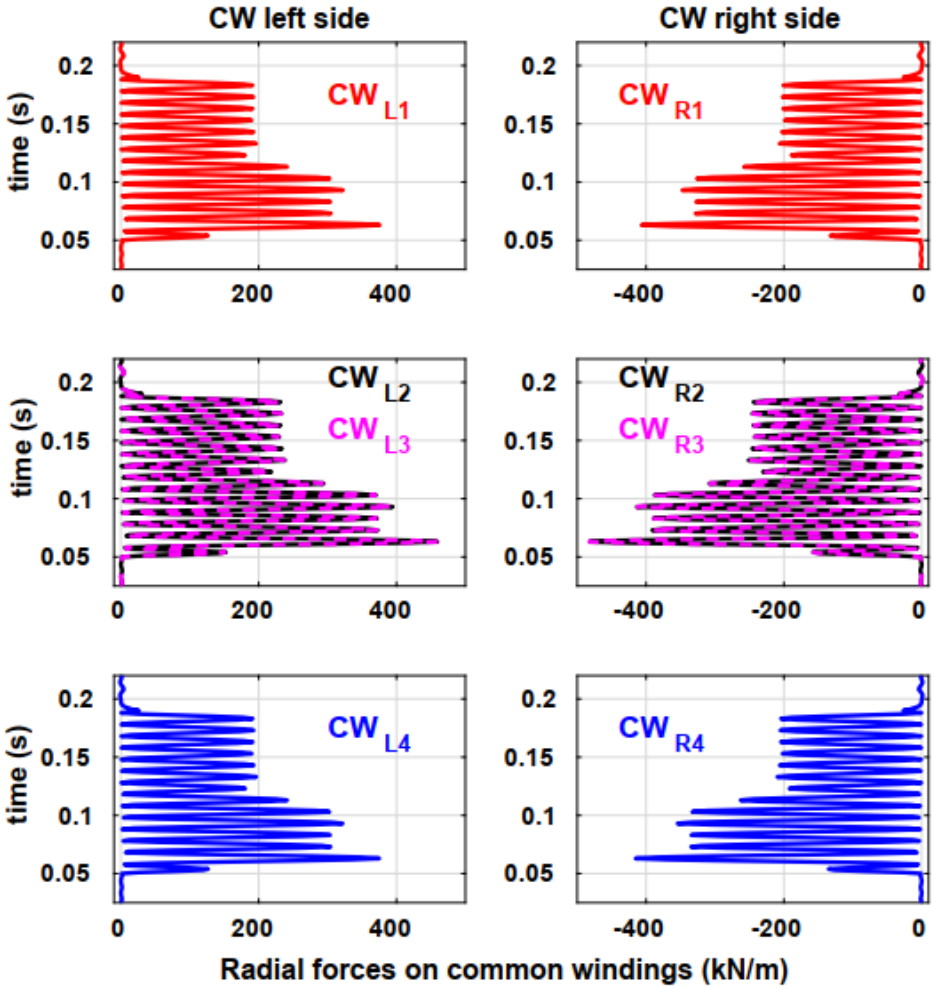


(b) Axial forces on series windings (kN/m).

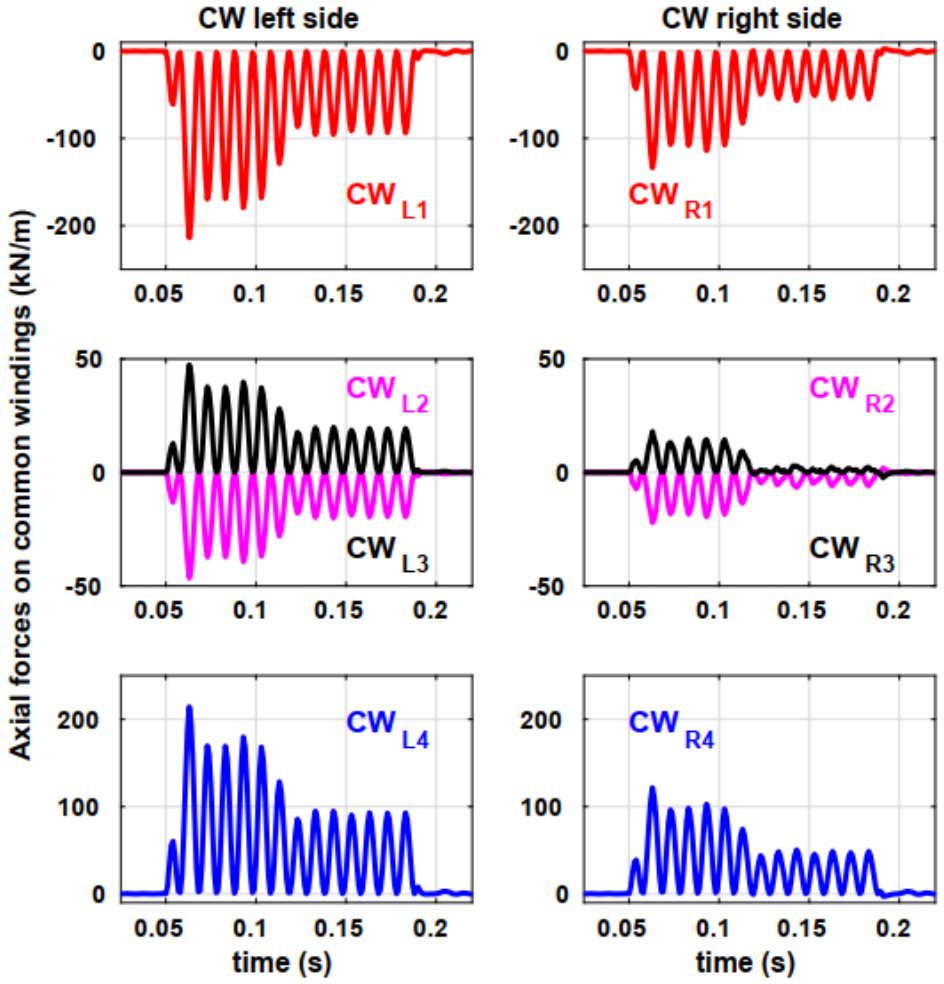
2) Digital Twin

a-phase common winding forces





(a) Radial forces on common windings (kN/m).



(b) Axial forces on common windings (kN/m).