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SweGRIDS

Improved observability in the power system:

Rotor angle measurements and support from faster voltage control.

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Supervisors: Urban Lundin (UU), Johan Abrahamsson (UU)

Project funded by:

Energimyndigheten

SVENSKA KRAFTNÄT

VATTENFALL

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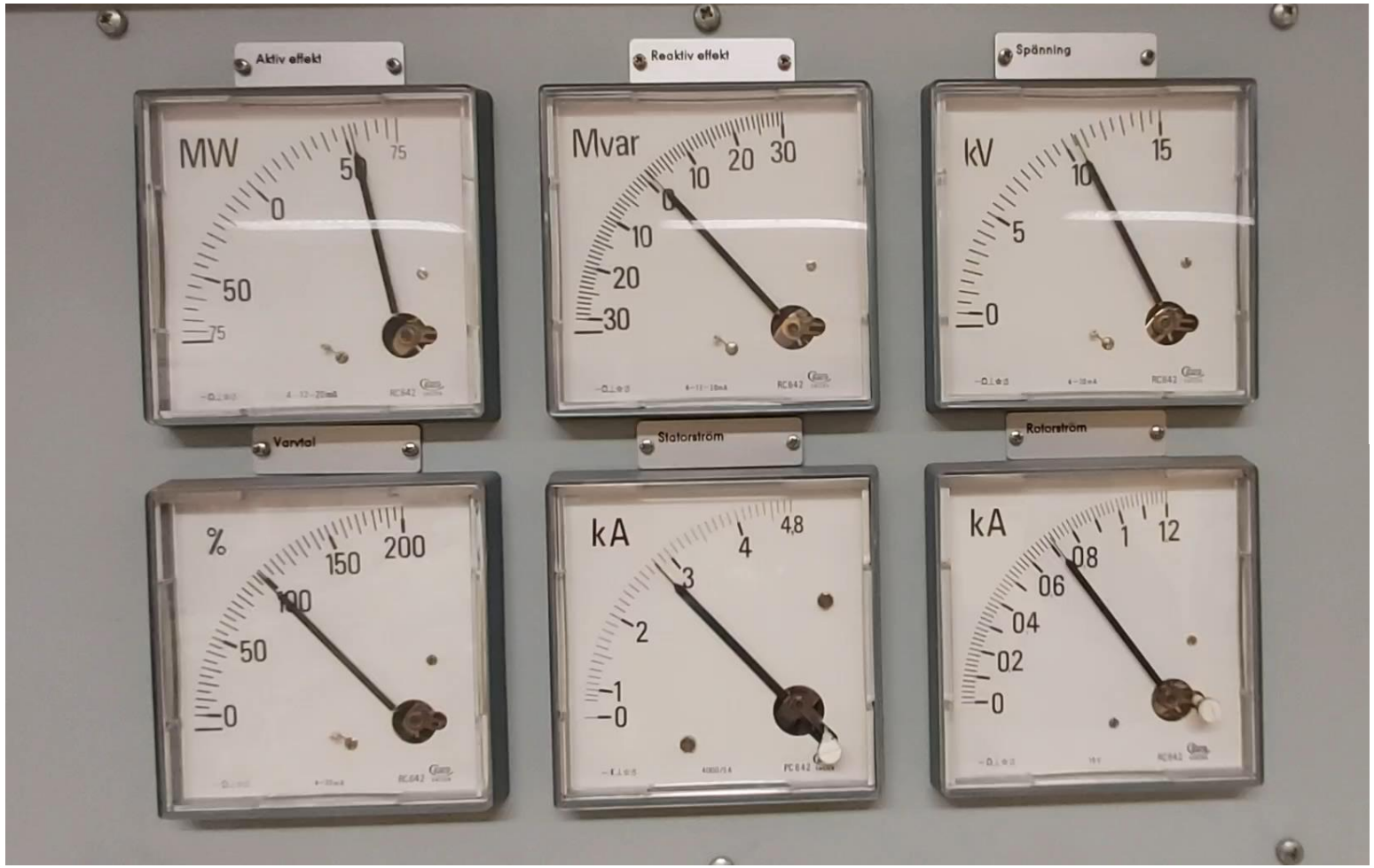
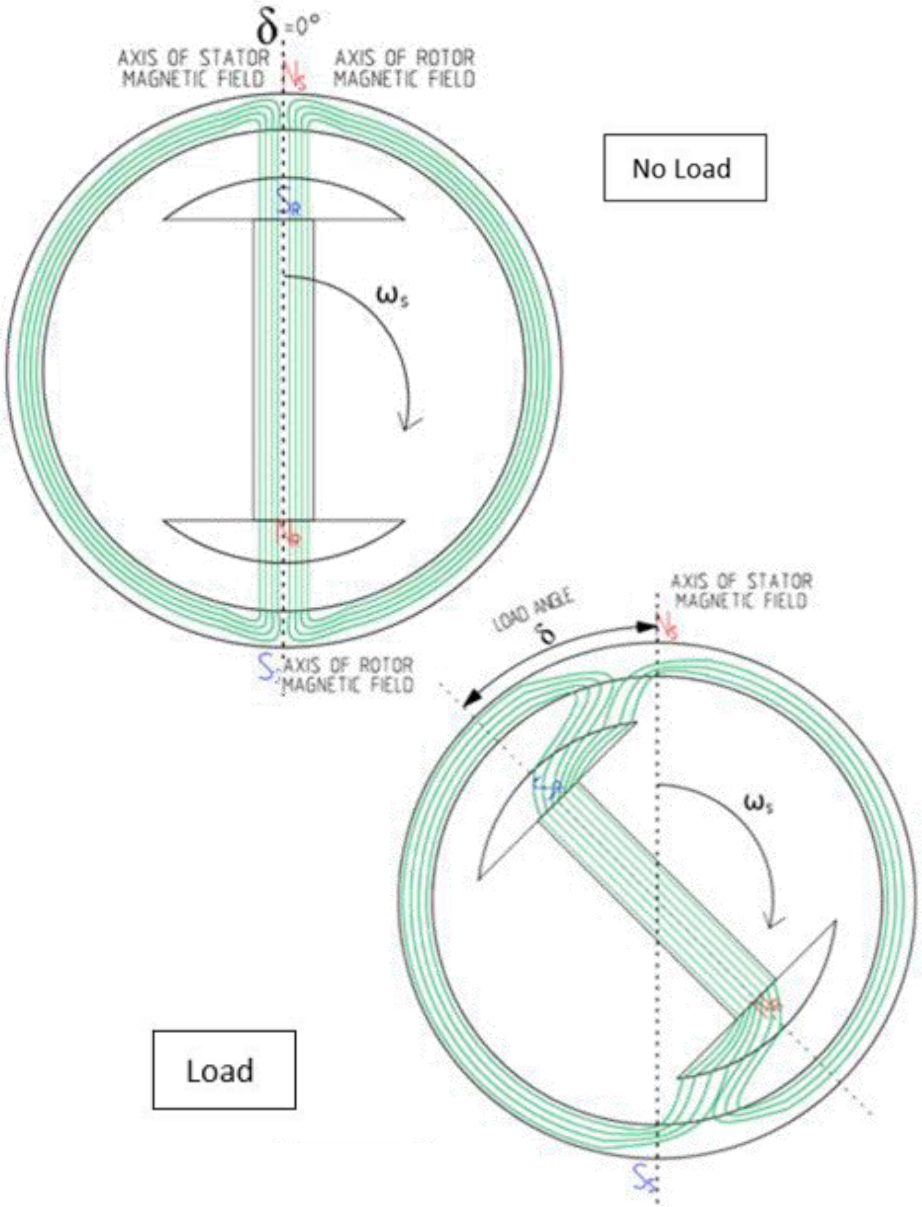
Background: Stability and Rotor Angle Oscillation





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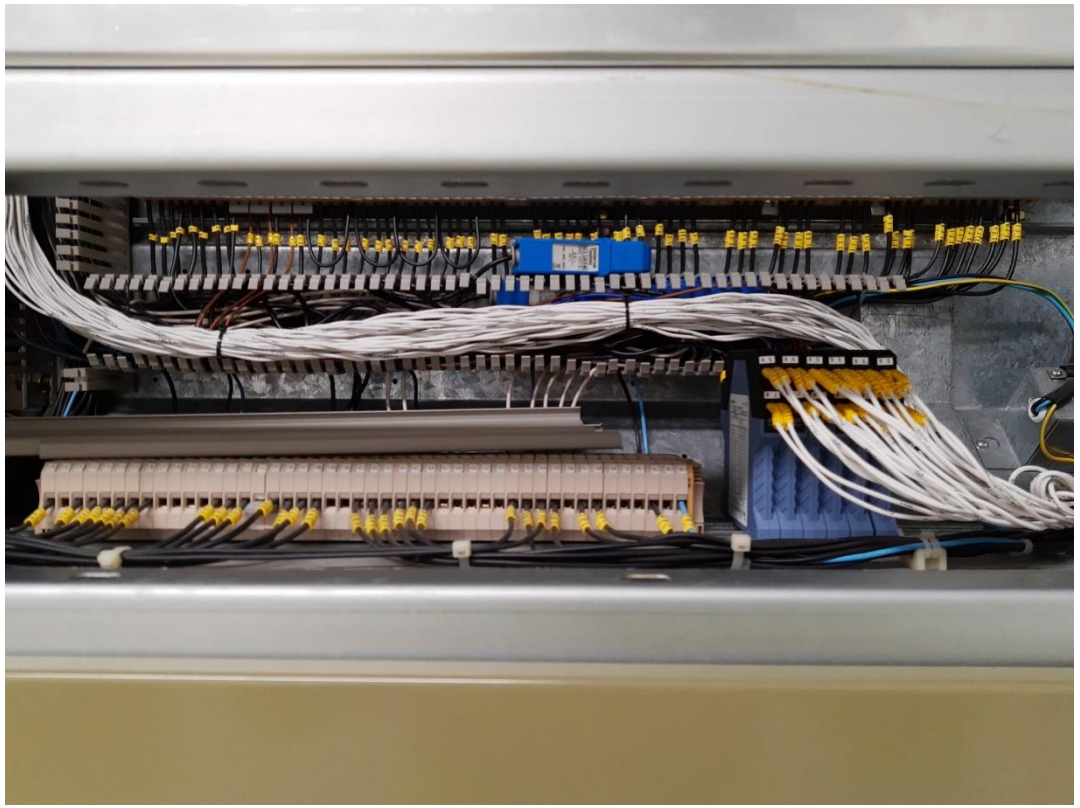
Measurements

Rotor Angle measurement

Voltages and Currents measurement



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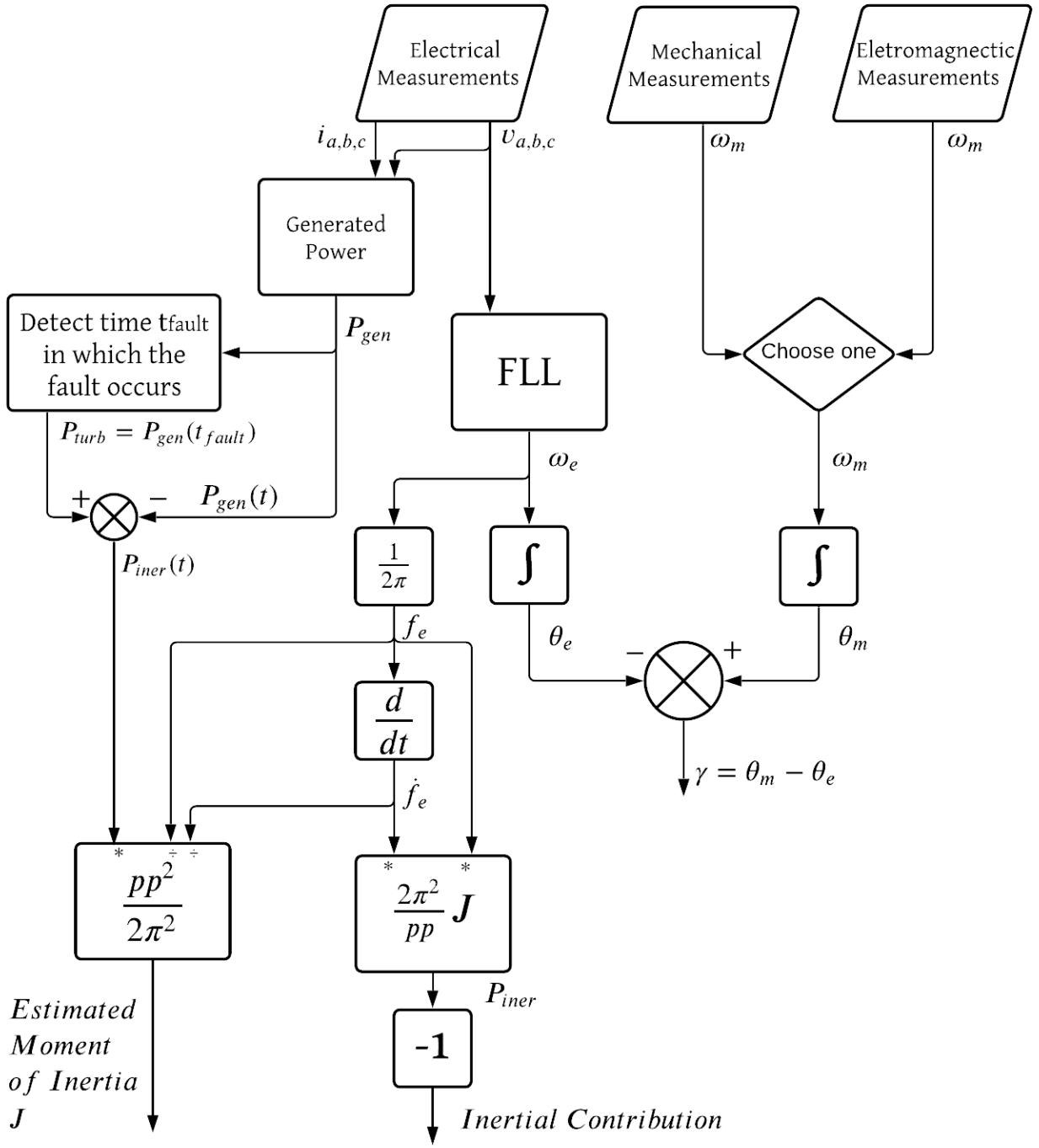
Code Structure

A single code was designed to estimate the wanted variables. The code can be divided into three sections:

- Rotor angle calculation;
- Inertial contribution calculation;
- Estimation of Moment of Inertia.



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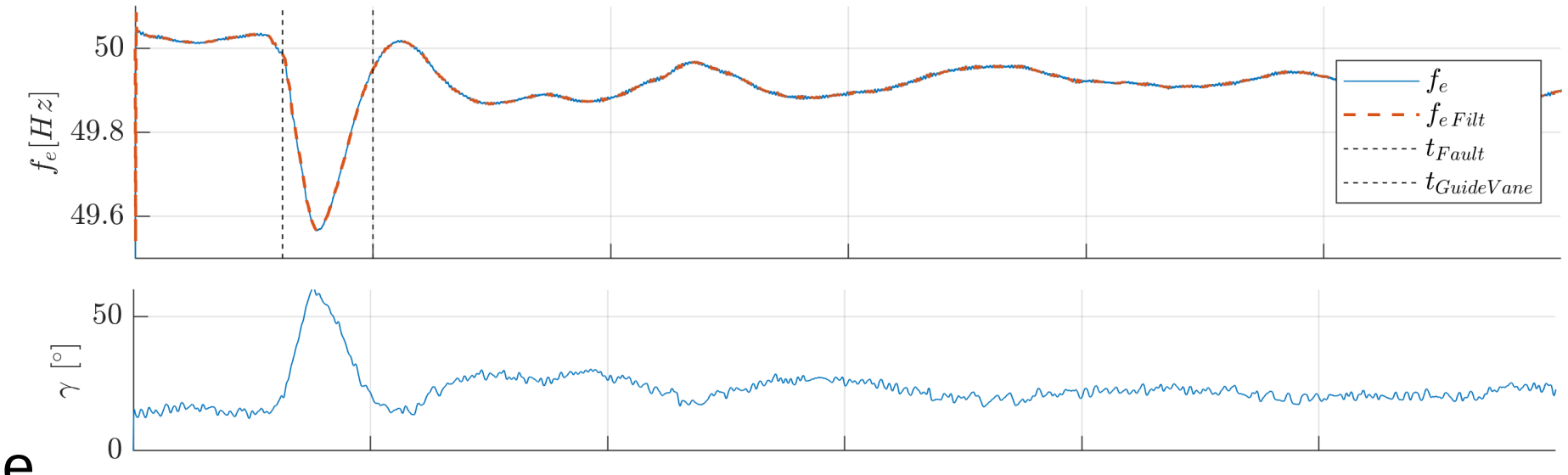
Results

A frequency dip of around 0.8% was measured.

The rotor angle oscillation was estimated using the flux speed.



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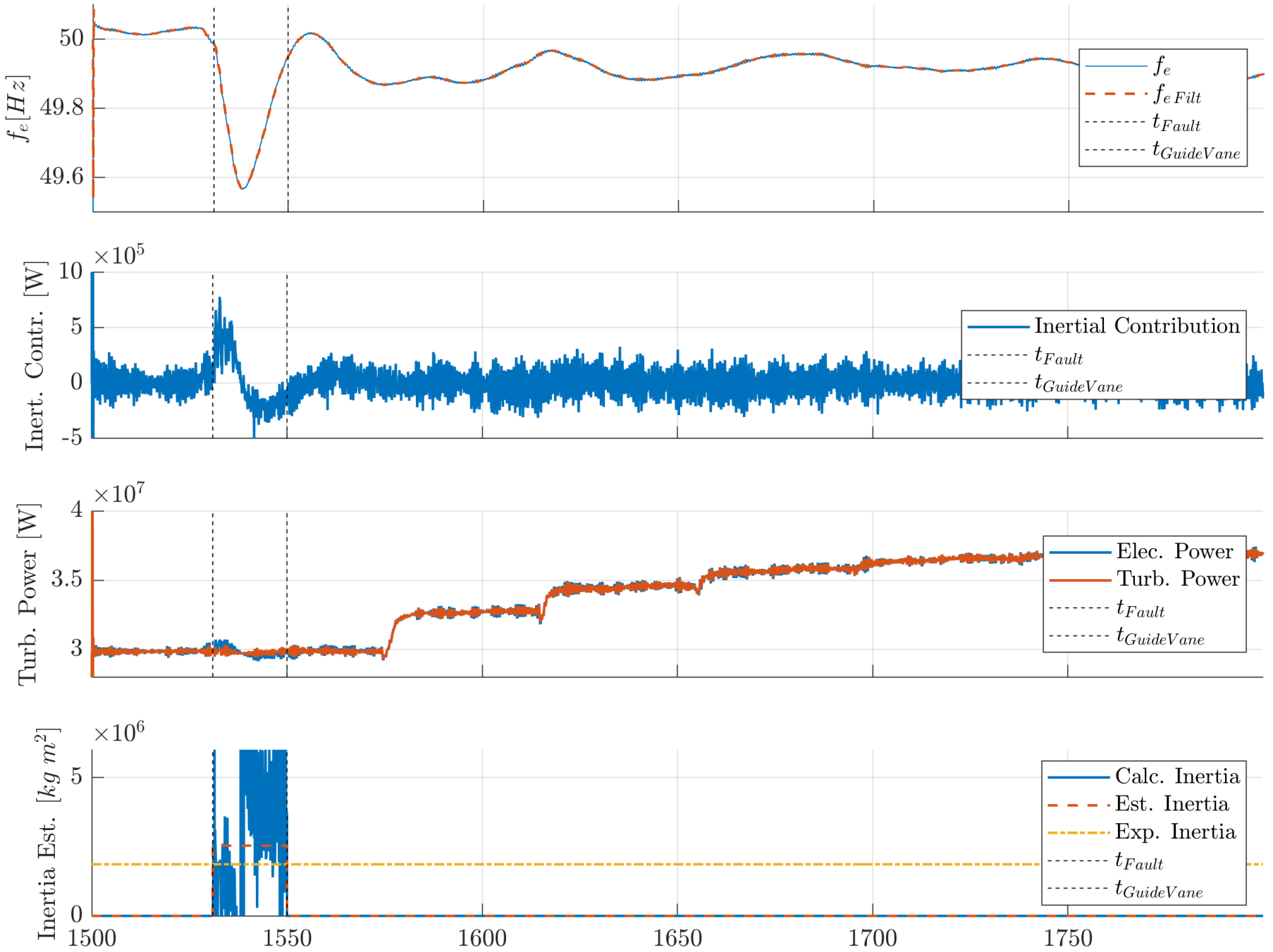
Using the electrical frequency and its derivative, it was estimated:

$$Inert.Contribution = -P_{iner}$$

$$P_{turb} = P_{gen} + P_{iner}$$

$$Moment\ of\ Inertia\ J(t)$$



THANK YOU!

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