Digital bridges: activity at INRIM
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Fully-digital bridge, two terminal-pair
- The bridge ratio accuracy is determined by the accuracy of the digital source employed
- Any complex ratio between impedances can be measured
- Average of two measurements by reversing the standards eliminates some source of errors
- Two terminal-pair definition is limited to mid-high impedance magnitudes (> 1 kΩ)

Digitally-assisted bridge, four terminal-pair
- Three arms, three standards: two (R, C) provide traceability, one is measured
- Accuracy is provided by the electromagnetic current comparator
- Careful choice of taps on the comparator allow to perform measurements in the whole complex plane
- Approximated four terminal-pair definition allow to extend the measurement range (10 Ω - 1 MΩ)

Measurements
Comparison between fully-digital and digitally-assisted bridges: consistency within parts in 10⁻⁵ or better

Scientific outcome

Perspective
Realization of the farad from the quantum Hall effect with a fully-digital bridge
Expected uncertainty: 1.3 x 10⁻⁷