



## THE NORTH AMERICAN SYNCHROPHASOR INITIATIVE **WEBINAR SERIES**

### Developing Methods for Locating Oscillation Sources by Extracting Interharmonic Components from Synchrophasor Data

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Recent advancements in power system oscillation research have revealed that phasor oscillations originate from the beating-wave phenomenon of voltage and current waveforms. Fourier analysis of these waveforms shows that certain spectral components, known as interharmonics, are the principal contributors to these oscillations. By extracting interharmonic components from waveform data, several practical applications have emerged—including the identification and localization of oscillation sources.

Despite the growing recognition of the value of waveform data for power system monitoring, its availability for oscillation monitoring remains limited. In contrast, PMU-based synchrophasor data is more readily accessible. This disparity prompts the question: is it feasible to extract interharmonic information from phasor data and develop similar applications without relying on waveform data? This presentation shares findings related to this inquiry. It demonstrates that for certain oscillation phenomena, interharmonic components can indeed be extracted from phasor data and used to locate oscillation sources. This presentation also addresses the limitations and challenges associated with inferring waveform-level information from phasor data.



Dr. Wilsun Xu received his Ph.D. from the University of British Columbia, Canada, in 1989. He worked at BC Hydro in Vancouver, Canada, for seven years before joining the University of Alberta in Edmonton, Canada, in 1996, where he is currently a professor. Dr. Xu has been engaged in power quality research, education, and consulting for over 30 years and is an IEEE Fellow for his contributions to power system harmonics research. From 2007 to 2020, he served as the Senior Power Quality Industrial Research Chair of the Natural Sciences and Engineering Research Council of Canada. Dr. Xu's research on disturbance source location and disturbance signal analysis has led to the findings shared in this webinar.

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Interested in learning more? Explore our previous webinars and related materials here, including the May session, [\*"IEEE C37.118.2-2024: Revised Standard for Synchrophasor Data Transfer for Power Systems,"\*](#) presented by Vasudev Gharpure.

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**Wednesday, June 25, 2025**  
**10:00 a.m. Pacific / 1:00 p.m. Eastern (1 hr.)**  
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