

“Phase” a Tool for Signal Processing. Uwe J. Hansen, Department of Chemistry & Physics, Indiana State University, Terre Haute, IN 47809

Of the five properties associated with wave propagation, frequency, wave length, speed of propagation, amplitude, and phase, phase is the most elusive. Yet, phase is a powerful tool. Used extensively in the 50's in magnetic resonance experiments to extract signals buried in noise, phase sensitive detection schemes became an essential tool for many experiments. Laser operation relies on phase coherence as an essential element, and holography and holographic interferometry are applications of phase considerations. Phase relations as applied in lock-in amplifiers, Lasers, Holography, Holographic Interferometry, Modal Analysis and Finite Element Analysis will be discussed and illustrated.

Uwe Hansen joined the ISU Physics faculty in 1968, with a PhD from Brigham Young University in 1966, after two years as an NRC/NAS Post-doctoral Associate at the US Naval Research Laboratory in Washington DC. His research has concentrated on the Physics of Musical Instruments with emphasis on mode studies. He served two three year terms as chair of the Physics Department. He is a fellow of the Indiana Academy of Science (IAS) and the Acoustical Society of America (ASA). He was recognized by IAS, ASA and CSUI with distinguished service citations. He served as president of the IAS, Executive Director of CSUI, and as editor of the Proceedings of the IAS. After retiring in 1998 he continued to teach at ISU until Dec 2014. His research has resulted in invited presentations at National and International Conferences, Government, Industrial and University Laboratories in Australia, Austria, Canada, China, France, Germany, Hungary, India, Italy, Japan, Mexico, the Netherlands, Norway, Trinidad, Russia, Sweden, Switzerland, the USA, and Yugoslavia.