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Modeling the Precedence Effect – how we arrived where we are today

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Throughout his career, Jens Blauert was interested in further exploring the precedence effect, an auditory phenomenon that enables us to localize sounds in rooms and other enclosures. A series of models that were developed at Bochum's Institute of Communication Acoustics under his leadership have changed the way we think about the precedence effect. While this effect as a psychoacoustic phenomenon is known for its complexity – for which Jens Blauert's talent to define precise terminology and listen critically came in handy – the modeling aspects are equally challenging due to the non-linear nature of the underlying auditory processes. Blauert and Cobben's binaural model from 1978 was already able to simulate observations related to the precedence effect. A few years later, Blauert's doctoral student Werner Lindemann introduced a binaural model with specific stages to model the precedence effect. Since then, almost all approaches to simulate the precedence effect are based on inhibitory elements. In this talk, the evolution of this class of models over several student generations at Bochum will be described, and the fruitful scientific exchange with other institutions such as Steven Colburn's laboratory at Boston University will be highlighted as well.