

A Model for Resolution Enhancement (Hyperacuity) in Sensory Representation

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Abstract: Heiligenberg (1987) recently proposed a model to explain how sensory maps could enhance resolution through orderly arrangement of broadly tuned receptors. We have extended this model to the general case of polynomial weighting schemes and proved that the response function is also a polynomial of the same order. We further demonstrated that the Hermitian polynomials are eigenfunctions of the system. Finally we suggested a biologically plausible mechanism for sensory representation of external stimuli with resolution far exceeding the inter-receptor separation.