

# Efficient Spike-Coding with Multiplicative Adaptation in a Spike Response Model

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**Poster ID: Th87**

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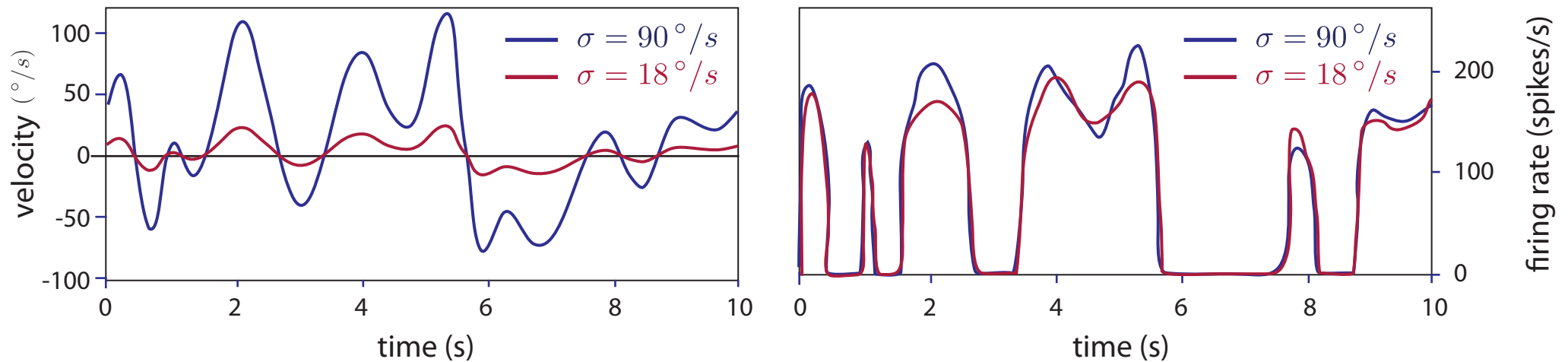
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# Neural Adaptation

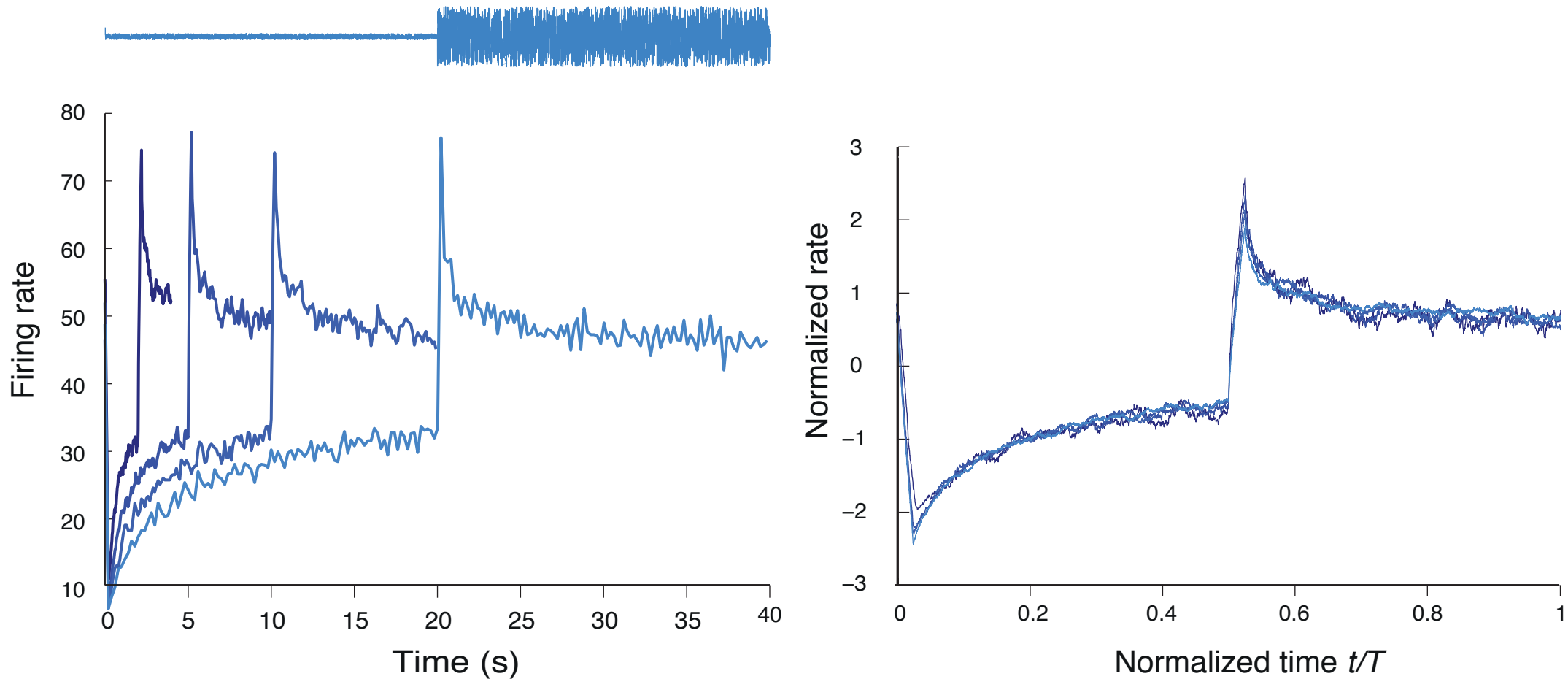
- Neural responses adapt to dynamic range



- Maximizes information transmission
- Implies multiplicative adaptation dynamics
- Spike-based model to resolve adaptation ambiguity
- ***Multiplicative Adaptive Spike Response Model***
  - Multiplicative spike-triggered dynamic threshold:  $\Delta\vartheta = \alpha\vartheta$

# Variance Switching

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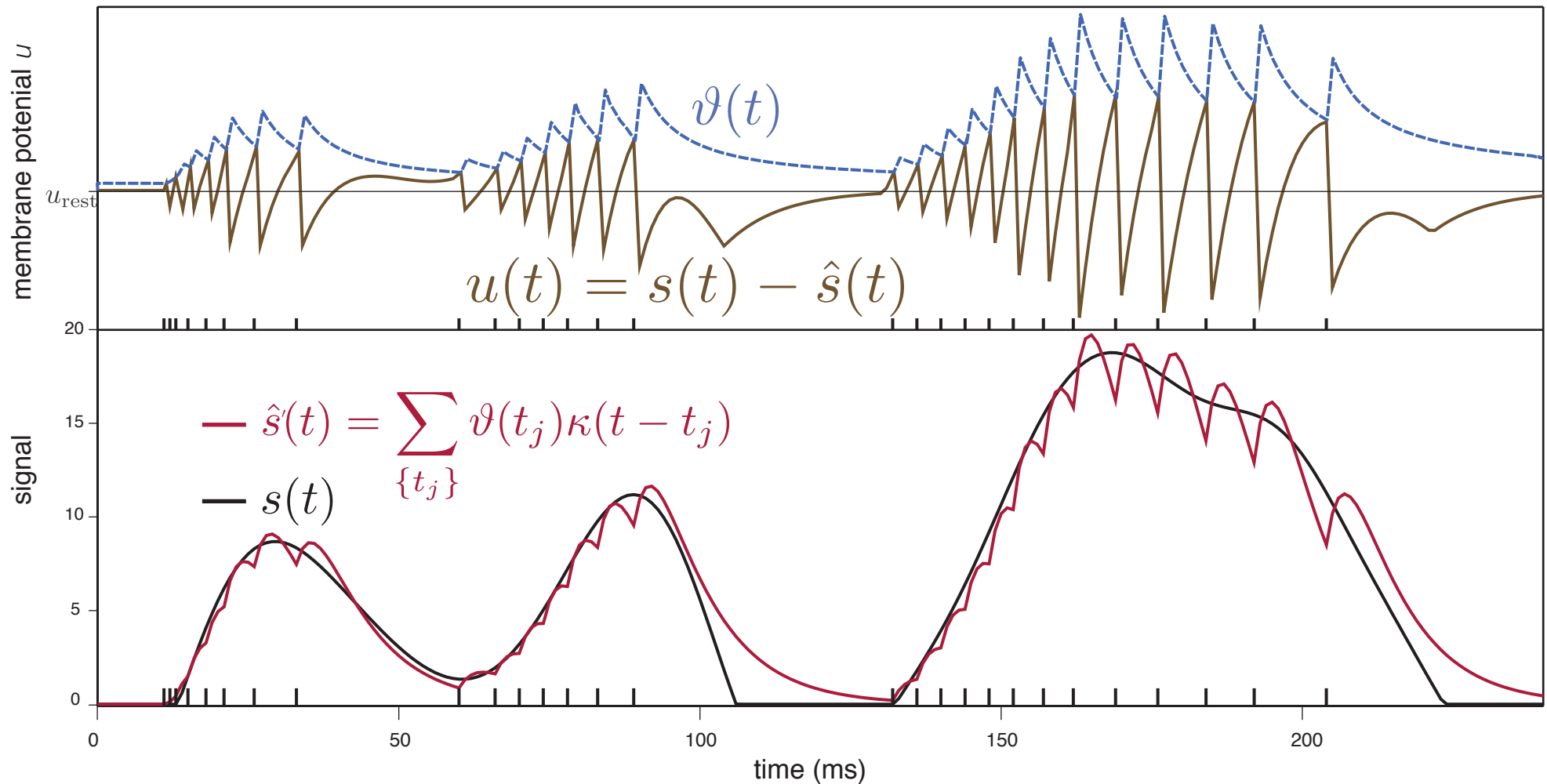


- Model captures scale-free adaptation in variance switching experiments [Fairhall2001,Brenner2000]
- Dynamically maximizes information transmission

# Adaptive Spike-Coding

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Interpret Multiplicative SRM as *adaptive spike-coding*



Maintains high coding efficiency with dynamic range changing up to 500x