

Large-scale cortical functional networks are organized in structured cycles. van Es MWJ, Higgins C, Gohil C, Quinn AJ, Vidaurre D, Woolrich MW. Nat Neurosci. 2025 Aug 27. doi: 10.1038/s41593-025-02052-8. [Article](#)

Re-interpretation based on the IPL mechanism

Let us conduct a neutral third person investigation by asking different LLMs the following question, "Can you examine the finding in the attached article (van Es et al., 2025) that activations of a canonical set of large-scale cortical functional networks are organized in an inherently cyclical manner matches with the expectations of the semblance hypothesis (www.semblancehypothesis.org) mathematically?"

Simplified answer: This study used large-scale neural recordings and showed that a) Activations of canonical functional networks (e.g., Default Mode, Salience, Executive Control, Visual) are neither static nor randomly fluctuating. Instead, they transition through a predictable & cyclical sequence. It is shown that this cycling occurs continuously, even during rest, & is an intrinsic property of the global cortical dynamics. They also showed that the transitions between networks follow a specific, non-random order. Even at rest, there is continuous sensory input (both external and internal) reaching the system.

Structure-wise: Inter-postsynaptic functional LINKs (IPLs) and islets of inter-LINKed spines (IILPs) naturally produces structured coupling and phase biases that can produce stable, periodic cycles with preferred phases for canonical networks reported by van Es et al.,

Function-wise: The continuous generation of semblances even during rest generates an internal model of the world. The system is expected to have a primary function to minimize the error between this internal model of the world and incoming sensory data.

Note: The semblance hypothesis will be correct only when the hypothesized inter-postsynaptic functional LINKs are proved experimentally.