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Experimental investigation of spatiotemporal phase coupling in drift wave turbulence. FREDERIC BROCHARD, THOMAS WINDISH, OLAF GRULKE, THOMAS KLINGER, Max-Planck-Institute for Plasma Physics, EURATOM Association, Greifswald, Germany, E5 TEAM — Intermittent coherent structures are a common feature of edge magnetized plasmas. Such structures, large compared to typical turbulent scales, can significantly contribute to the high cross-field particles and energy transport in fusion experiments. Since a net energy transfer must be accompanied by a finite phase coherence between the involved structures, it can be investigated using a bicoherence analysis, which provides a direct measurement of nonlinear phase coupling. Although the physical process happens in k and not in ω space, experimental diagnostics usually suffer from a very limited spatial resolution. Thus, frequency-based bicoherence techniques are generally performed along with attempts to connect k with ω representations. In this contribution, we will present results of a direct k-bicoherence analysis, performed with measurements from a poloidal array of 64 probes, in the linear magnetized helicon device VINETA. A wavelet bicoherence is used in order to refine the description of spatiotemporal intermittent regimes. The k-bicoherence is shown to be much more accurate than the ω-bicoherence, revealing a bursty behaviour with a characteristic burst duration shorter than the characteristic period of the signals. It is shown that during these events small structures can be produced by phase coupling processes between large structures, and vice-versa.

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