



Are Modern Concepts of Complex Systems Science Useful for Earth Sciences? (Lewis Fry Richardson Medal Lecture)

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The application of methods of complex systems science has a rich tradition in Earth sciences and has enabled substantially new insights into various complex processes there. However, some approaches and findings have been controversially discussed over the last decades. One reason is that they are often basing on strong restrictions and their violation may lead to pitfalls and misinterpretations.

Here, we discuss three general concepts of complex systems science: synchronization, recurrence and complex networks and explain that they are indeed useful for better understanding phenomena as recent and past monsoon or El Nino, to detect paleoclimate-variability transitions which are related to human evolution and to identify teleconnections.

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