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Alexander Y Klimenko* (klimenko@mech.uq.edu.au). *Complex cyclic behaviours in competitive systems and the ubiquitous nature of intransitivity.*

Many complex systems that involve competition in one form or another tend to evolve cyclically. Examples of cycles can be found in economics, history, biology, technology, science and almost any other area where elements, species or ideas compete against one another. This brief 10 minute presentation will outline an approach that may bring an explanation for persistence of these cycles and other patterns of complex behaviour (e.g. competitive cooperation) in systems that, seemingly, are radically different and belong to very different fields of science. The suggested approach is generic and based on randomly walking elements that compete according to a pre-selected set of rules. The analysis indicates that the common cause of complex behaviours is intransitivity of the competition rules. While intransitivity has been long argued as being illogical or irrational (conventional orders are transitive by definition), it seems that intransitivity is necessarily and ubiquitously present in nature. (Received August 22, 2016)