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Weather, macroweather and climate: intermittency, and extremes

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It was recently found that the accepted picture of atmospheric variability was in error by a large factor. Rather than being dominated by a series of narrow scale-range quasi-oscillatory processes with an unimportant quasi-white noise “background”, it turned out that the variance was instead dominated by a few wide range scaling processes albeit occasionally interspersed with superposed quasi - oscillatory processes. Although the classical model implied that successive million year global temperature averages would differ by mere micro Kelvins, the implausibility had not been noticed. In contrast, the new picture inverts the roles of background and foreground and involves four or five wide range scaling processes. As with any new paradigm, there are consequences; in this presentation we focus on the implications for the intermittency and the extremes. Intermittency is an expression of the spatio-temporal sparseness of strong events whereas the extremes refer to the tails of their probability distributions. Although we give some results for the macro and mega climate regimes, we focus on weather, macroweather and climate: from dissipation to Milankovitch scales.