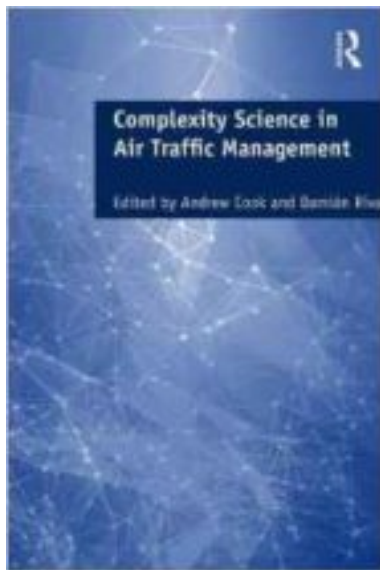


COMPLEXITY SCIENCE IN AIR TRAFFIC MANAGEMENT



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Air traffic management (ATM) comprises a highly complex socio-technical system that keeps air traffic flowing safely and efficiently, worldwide, every minute of the year. Over the last few decades, several ambitious ATM performance improvement programmes have been undertaken. Such programmes have mostly delivered local technological solutions, whilst corresponding ATM performance improvements have fallen short of stakeholder expectations. In hindsight, this can be substantially explained from a complexity science perspective: ATM is simply too complex to address through classical approaches such as system engineering and human factors. In order to change this, complexity science has to be embraced as ATM's 'best friend'. The applicability of complexity science paradigms to the analysis and modelling of future operations is driven by the need to accommodate long-term air traffic growth within an already-saturated ATM infrastructure. Complexity Science in Air Traffic Management is written particularly, but not exclusively, for transport researchers, though it also has a complementary appeal to practitioners, supported through the frequent references made to practical examples and operational themes such as performance, airline strategy, passenger mobility, delay propagation and free-flight safety. The book should also have significant appeal beyond the transport domain, due to its intrinsic value as an exposition of applied complexity science and applied research, drawing on examples of simulations and modelling throughout, with corresponding insights into the design of new concepts and policies, and the understanding of complex phenomena that are invisible