

COMPUTER MODELLING OF COMPLEX COUPLED SYSTEMS

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Most stratigraphic forward modelling software simulates the response of a sedimentary system to externally imposed controls which are not affected by the sedimentation process. A good example is modelling of carbonate platform architectures resulting from given sea level curves. However, many important controls on sedimentation are altered by the sedimentation itself. Good examples of situations where such feedbacks occur are: -(i) Salt tectonics and sedimentation. (ii) Waves, currents and sedimentation. (iii) Mixed clastic/carbonate systems. (iv) Compaction/cementation and sedimentation. Modelling these coupled systems is more challenging than modelling of simpler systems because of mismatched time scales, amplified numerical instability, the chaotic dynamics of non-linear coupled systems and the difficulty of combining very different types of algorithms.