Cumberpatch, Z.A., Finch, E., and Kane, I.A., 2021, External signal preservation in halokinetic stratigraphy: A discrete element modeling approach: Geology, v. 49, https://doi.org/10.1130/G48448.1

TABLE S1.

Property	**Modelled value**	**Justification**
Salt		
Young's modulus (*E*)	3.65 GPa	Previous experiments (Liang et al. 2012; Pichel et al. 2017;2019) use similar values.
Poisson's ratio (*v*)	0.33	This value was used by Pichel et al. (2017; 2019), and corresponds to natural examples (Jackson and Hudec 2017).
Density (ρ)	2.22 gcm^{-3}	Slightly higher density than pure halite (2.16 gcm^{-3}) to account for heterogeneity within the diapir. Similar value used by Fuchs et al. (2011) and Pichel et al. (2017;2019)
Viscosity (μ)	1.1 x 10^9 Pa.s	The same value used by Pichel et al. (2017;2019), lower than the real world viscosity (10^{17-18} Pa.s) but provides a reasonable approximation compared to physical models (10^4 Pa.s)
Breaking separation (BS)	0.001	An approximation of the mechanical behavoir of rock-salt is achieved by reducing the breaking separation of particles representing salt to the point that they exhibit viscous plastic macroscopic behaviour during deformation. Biaxial compression tests conducted by Pichel et al. (2017) show that rocks with a breaking separation of 0.001 react with a non-localized and pervasive breaking of bonds, and generate a linear and horizontal response with insignificant elastic component, representative of ductile viscous-plastic materials that accumulate strain without significant variations in stress. Such characteristics are therefore capable of representing rock salt.
Source layer thickness	150 m	Layers below 100 m are thought to be insufficient for significant salt flow (Jackson and Hudec 2017).
Original height	1050 m	A wide range of diapir heights are observed in nature, this value is 70% of the initial total overburden thickness (1500 m) and thus satisfies the simple force balance conditions for diapiric rise proposed by Schlutz-Ela et al. (1993)
Original width	750 m	A wide range of diapir width are observed in nature, width is similar to Pierce diapirs (Davison et al. 2000).
Rise rate	0.023 mm a^{-1}	Dependent on diapir type and emergence rates can vary from 0.0008-3000 mm a^{-1} (Jackson and Hudec 2017). 0.023 mm a^{-1} is the rise rate of the buried crest of North Pierce (Davison et al. 2000).
Early diapiric sequence (overburden)		
Young's modulus (*E*)	6.75 GPa	Similar value used by Pichel et al. (2017;2019).
Poisson's ratio (*v*)	0.22	Similar value used by Hamilton-Wright et al. (2019).
Density (ρ)	2.4 – 2.6 gcm^{-3}	Density increases linearly with depth, to simulate natural conditions, values are typical for siliciclastic sedimentary rocks and those used in recent models (Pichel et al. 2017;2019).

Breaking separation (BS)	0.023-0.027	Breaking separation increases linearly with depth, to simulate an increase of strength due to compaction with depth. Similar values used as overburden in compression and extensional settings (Finch et al. 2003; 2004) and halokinetic settings (Pichel et al. 2017;2019). Finch et al. (2004) use biaxial compression tests showing the formation of well defines fault segments, typical for brittle materials at similar breaking separations.
Thickness	450 m	Very thick roof thicknesses may retard halokinesis (Jackson and Hudec 2017). This value accounts for 30% of the initial model thickness, thus satisfying the simple force balance conditions for diapiric rise proposed by Schlutz-Ela et al. (1993).
Syn-kinematic sedimentation		
Young's modulus (*E*)	5 GPa	Similar value used by Pichel et al. (2017;2019).
Poisson's ratio (*v*)	0.20	Similar value used by Hamilton-Wright et al. (2019).
Density (ρ)	2.3 gcm^{-3}	Typical value for uncompacted sedimentary material, similar values used in recent numerical models (Pichel et al. 2017;2019; Hamilton-Wright et al. 2019).
Breaking separation (BS)	0.023	Similar values used by Pichel et al. (2017; 2019) to model syn-kinematic sedimentation in compressional salt tectonic settings.
Sedimentation rate	0.15 – 0.45 mm a^{-1}	Sedimentation rates are wide ranging and can span 11 orders of magnitude, depending on depositional environment. Values chosen are similar to Cenozoic depositional rates in the North Sea (de Haas et al. 1996) and recent models (Fuchs et al. 2011; Hamilton-Wright et al. (2019).