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Salt lake deformation detected from space

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We use the deformation time series retrieved by applying satellite radar interferometry techniques for the period from 2003 to 2008, to investigate the spatiotemporal evolution of salars in the Atacama desert in Chile (24-26°S). We find that all 12 salars surveyed are actively deforming, with displacement rates from -1.4 to 1.5 cm/yr in the satellite line-of-sight direction. Displacement rates are generally constant in time and space, mostly confined to the salar itself. To understand the reason for this displacement signal, we further compare these observations with LANDSAT imagery and field observations. Relationships between these observations suggest that the most rapid uplift regions indicate subsurface material accretion. Different saline hydrologies explain this accretion, including capillary halite precipitation developing below a superficial salt crust. We further propose that salars, whose dynamics are dependent on the presence of brine and resurging saline groundwater, may be used as potential indicators of water resource and evolution in the central Andes, and in arid and semi arid regions elsewhere.