



Evidence of ground subsidence at the Nice Côte d'Azur International airport from InSAR time series analysis

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Made-man lands are commonly used to increase surface for cities development. It is notably suitable to build flat and unobstructed airport runways. However, the stability of those constructions is a permanent concern. Nice côte d'Azur airport has been built in such reclaimed lands due to the lack of flat land in this area confined between the Mediterranean Sea to the south and the French Alps to the north. In 1979, a newly built extension to the runway platform gained over the sea collapsed, triggering a local tsunami and causing important damage. The project of land extension stopped, but the present airport platform is still located on reclaimed land. In this paper, we investigated the stability of the airport platform and the surrounding area using InSAR data for the period (2003-2011) from both ascending and descending tracks. We estimated the vertical deformation in combining the two lines of sights (LOS). Noise estimation on the InSAR measurements has been performed and shows a high signal-to-noise ratio. Actually, noise follows a gaussian distribution with a standard deviation of 0.26 mm/yr. This allows to have a very detailed image of the airport platform deformation and its surrounding. We found that the whole Var delta, that hosts the airport, subsides at very low rate (between 0.5 mm/yr and 1 mm/yr). This subsidence rate jumps to 2 mm/yr across the reclaimed land limit with the land and then still increases toward the sea to reach 3 mm/yr. In addition, significant areas along the edge of the airport move up to 10 mm/yr downward.