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Backscattering analysis of metallic platforms in Gulf of Mexico via multi-polarization TerraSAR-X data

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The recent discovery of a significant number of oil and gas deposits in the seabed increased the amount of offshore installations. Offshore platforms are potential environmental threats, obstacles for yachts, low flying airplanes and merchant ships making at risk the safety of maritime traffic. In principle, any metallic target over the ocean surface is responsible for a larger backscattering compared to the one coming from the surrounding sea surface. For this reason, offshore platforms are expected to appear in SAR intensity images as spots brighter than the background sea. However, the measurements reported in this paper show that information provided by backscattered intensity collected in single-polarization is not always sufficient to effectively observe offshore platforms. Exploiting the multi-polarization capabilities of TerraSAR-X, different factors affecting the backscattering of offshore platforms, and hence their detection, is deeply analysed. In particular, under different viewing geometries, all dual-polarimetric modes are investigated.