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Clouds formned by human causes: an analysis of 3-years period of observations.

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The latest version of the International Cloud Atlas presented by the WMO on March 2017 has considered the clouds caused by human activities as a type of clouds that should be take into account in weather observations. Mazon et al. (2012) defined as anthropoclouds those clouds clearly caused by human activities, encouraging weather observers to take note and to differentiate this kind of clouds than those non-anthropic ones, and to international and national administrations to promote this type of observations. The influence of clouds on the Earth's energy budget has an important role and has been studied by several authors (e.g. Hartmann et al., 1992; Stuben, 2006); Minnis et al., 2003; Ponarter et al., 2005; Stuben and Forster, 2007). The combustion of a large amount of fossil fuel injects condensation nuclei, water vapor and heat into the troposphere and enhances cloud formation, whilst the increase in air traffic over recent decades has brought about an increase in the formation of condensation trails, which can be persistent. The identification and classification of anthropoclouds can contribute to the study of future trends regarding these clouds, as well as the contribution our activities make toward cloud formation, the role of cloudiness in the Earth's energy budget and its contribution to climate change.
In 2014, the Meteorological Service of Catalonia started a project for observing these types of clouds over 6 official weather observers, from the weather observers network (XOM) (Ripoll et al., 2016), spread on Catalonia. They used the nomenclature defined in Mazon et al. (2012), by using the prefix a- before the main cloud genera if they are clearly caused by human activities. The observers recorded the observation between one and three times per day during three years. The first results of this pioneer project are analyzed. The main anthropic clouds recorded have been high clouds, formed from contrails: anthropocirrus (aCi), anthropocirrocumulus (aCc) and anthropocirrostratus (aCs). In average, around 25% of the total high cloud recorded in an observation have been high anthropoclouds in these observations.