



## **Study of the radiative properties of clouds and their influence on the mass balance of a glacier in the inner tropical region**

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Radiative flows affect the climate and ecosystems of the planet while the presence / absence of clouds affects the intensity of these flows at the level of the earth's surface. For this reason, this study aims to determine the radiative properties of the clouds and their impact on the mass balance and balance of surface energy balance on the Antisana glacier (0.4° S, 770°, 5760 m), located in the province of Napo, Ecuador. It is based on meteorological measurements taken in the lateral moraine of glacier 15 $\alpha$  by a station at 4850 m of height, during the period 2005-2015. For this purpose, the theoretical radiation in clear sky was parameterized to the specific conditions of the glacier (high altitude and low latitude). We defined the indices, infrared emission factor of clouds (F) and transitivity of clouds for solar radiation (Tn), which provide information on the physical properties of clouds and the number of days cleared for each year in this area. The cloud radiative forcing index of the incident flows and the radiative balance on the surface provides information on their global effect. The radiative properties of the clouds were determined globally on a pluriannual and annual basis, based on the hydrological year, which begins in September and ends in August. Then the study was tuned to a shorter time scale, because the Antisana glacier area is subject to rainfall throughout the year without having a marked seasonality, but we could evidence two periods, a period with greater and another with lesser number of clear days; July-August-September (JAS) and March-April (MA), respectively, giving a total of 57 days with clear sky per year. The cloud radiative forcing in the incident flows was systematically negative. Finally in terms of cloud forcing in the radiative balance of the surface, there is a heating and cooling effect since this radiative forcing has a strong dependency on the albedo.