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Identifying cloud objects in the km-scale earth system model ICON

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Clouds crucially impact Earth's climate. The distribution of clouds, horizontally and vertically, influences the radiative transfer through the atmosphere. Hence, to correctly compute the radiative transfer, it is important to understand the horizontal and vertical distribution of clouds. Km-scale earth system models enable to resolve convection explicitly and offer the potential to represent cloud patterns more realistically. We investigate simulations of the earth system model ICON with a horizontal resolution of 5 km performed within the project nextGEMS. We identify cloud objects using connected component labelling. The method is applied to the vertically integrated cloud field as well as to the global three-dimensional cloud field. We analyse the distribution of cloud objects, their water and ice content as well as their fractal dimension on a global and regional scale. The choice of the threshold for identifying cloud objects strongly influences the analysis of the objects.