【別紙２】

論文名：Development of a New Scheme for Seamless Detection and Tracking of Cutoff Lows and Preexisting Troughs　(要約)

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（以下要約を記入する）

A new automated numerical scheme to detect cutoff lows, which are upper tropospheric cyclones starting in the preexisting trough of westerly jet, from meteorological global reanalysis data has been proposed. It has unique features that the intensity, size, and background gradient of each cutoff low can be obtained from a raw snapshot field of geopotential height on a pressure level. Thus, the proposed scheme is easy to handle, and the products are highly objective. The proposed scheme quantifies the geometric features of depression from its horizontal height profile. The height slope of a line intersecting the depression bottom and the nearest tangential point (optimal slope) locally indicates the intensity and scale of an isolated depression. In the process of the calculation, a local background height slope is automatically removed from a geopotential height field, so that the cutoff low and its preexisting trough are seamlessly detected as an identical depression. Differences between the proposed scheme and the preceding schemes are discussed. Climatological comparisons of cutoff lows are conducted to determine the utility of the proposed scheme. And the mathematical formulation is attempted with a simple model of cutoff low and summarized in Supplemental Materials.