Nocturnal heat island intensity and its circulation

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It was shown that it was a heat island observation of Kyoto to which it went from 2004 to 2006, and the difference of the heat inertia of the city part and suburbs was a great factor as the cause of the heat island of nighttime. The temperatures fluctuate of the city part and suburbs is expected to increase from the sunset to the dawn monotonously if it is thought that the heat island of nighttime in the city part is caused by the difference of the heat inertia. However, temperatures fluctuate was observed for the temperatures fluctuate of the city part and suburbs to be going to become the maximum in 2-3 hours after the sunset if a typical temperature change at nighttime of the day that often cleared up was examined, and to decrease until the dawn. The purpose of this is for the air cooled from suburbs in 2-3 hours after the sunset to flow and to cool the city part. The phenomenon of heat island strength's becoming the maximum in several hours after the sunset is observed well in a lot of cities, and looks like the generic diagnostic of the heat island phenomenon rather than a peculiar phenomenon to the city. Then, the characteristic of this heat island circulation was considered based on the analysis of the horizontal convection of Mori and Niino(2002 JAS).

Mori and Niino(2002) thought about the initial value problem when only the temperature was lowered in the step function at a part of temperature time 0 of a lower boundary in the same stratification fluid layer. As a result, the flowfield showed the classification into Gravity style regime in which Gravitational wave regime in which the gravitational wave became predominant and the cooled fluid effused to non-cooling part as a gravity style in the first stage according to the ratio of stratification strength of a basic place and stratification strength of the boundary layer in the cooling part afterwards though it became Diffusion regime in which diffusion became predominant. He can interpret it again by paying attention to the momentum generated with the differential pressure and it caused in the boundary of the cooling part and non-cooling part (reception desk) though they physically interpreted the boundary of this regime from the comparison between the phase velocity of the gravitational wave and the speed of the gravity style. As a result, so that the internal gravitational wave generated in the reception desk part may do the generated momentum in the differential pressure and the balance of carrying away in the gravitational wave regime, the reception desk doesn't move basically, and, on the other hand, it has been understood that the flow that the reception desk is accompanied as a gravity style flows out to non-cooling part because it doesn't carry by an internal gravitational wave in the gravity style regime because the generated momentum is too large. As for the boundary of this regime, stratification strength added to the boundary layer in the cooling part becomes equal for stratification strength of a basic place. That is, when the gravitational wave regime and the twice are exceeded if stratification strength of the cooling part (basic place + boundary layer) is twice or less stratification strength of a basic place, it becomes a gravity style regime.