

# Influence of stemflow from deciduous tree on soil water using electric resistivity survey.

# Kyoko Ohsumi[1]; Jun Shimada[2]; Kazuhiko Ohba[3]

[1] Systems in Natural Environment, Kumamoto Univ; [2] Fac. of Sci., Kumamoto Univ.; [3] Agri-Meteorology, KONARC

## 1. Research purpose

A decrease in the groundwater recharge region by urbanization becomes a great factor in recent years, and the decrease in the underground water table becomes a problem though Kumamoto City is rich abundant underground water. Therefore, it is necessary to understand the underground water recharge function in the mountain forest of the hometown around Kumamoto City. The stemflow is quantitatively little compared with rain in the woods, and precipitation that gets to the woods floor has been thought that the precipitation under few, that is, trees is a little in general outside the tree crown in the research of the past as for the surrounding of the tree trunk. The stemflow of the Oak woods that is the fallen leaf tree with broad leaves. I evaluate the influence on shallow soil moisture distribution by using the ratio resistivity survey in this researching then.

## 2. Observation method and observation period

Observation period: 28 in June, 2003 of the field observation, Observation item on soil sampling June 12 December 31, 2004 2002, and June 26.

stemflow, throughfall, resistance object, pressure water head in shallow depth, Beechen department Conara belonging Oak (fallen leaf tree with broad leaves) and density of tree trunk: 3.5 tree/a and average tree height: 13m

## 3. Result and consideration

To see the characteristic of the flowing quantity of the tree trunk of the leafless season (January - March) and leafed season (April - December), precipitation and stemflow flowing rate (Herwitz(1986)) were requested. Thus, it characterizes, and the flowing quantity of the stemflow has understood the stemflow flowing rate rises in the leafless season with low density of the tree crown about the Oak tree that is the tree with broad leaves. This is thought that characteristic originates an increase of the interception chiefly for the form of a feature leaf and the trunk in the tree canopy.

Two dimension pF section was made from the empirical formula of the ratio resistance obtained from the resistivity survey and the pressure hydraulic head who had measured it. Arbitrary. elect. point. under the trunk tree and under no trunk tree, It was relatively in moist environment throughout the year when both were compared. It is thought that this originates in a local rainfall input form of the interception of solar insolation and the stemflow that depends on the tree canopy.

Next, downward flux from the woods floor without the trunk tree was as much as 2.2 times as large. the result of trying the amount of infiltration of the stemflow and trying the quantitative evaluation and right under the tree trunk. Therefore, it was confirmed that right under the tree trunk was an environment to make relatively downward flux excel on the woods floor. It makes comparative study of these by a relative value in the object district in the Oak woods since it multiplies, therefore the stemflow infiltration contribution region is growing with 36.9% as 22.8% and amounts of the underground water training compared with density 0.115m<sup>2</sup>/m<sup>2</sup>(1.15%) of the tree trunk in the Oak woods. Existed, that is, the existence of the stemflow the tree contributing to the descent infiltration and training more greatly than rain in the woods in respect of the underground water recharge function became clear.