

## Research on improved thermal inertia model for retrieving soil moisture

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In order to improve accuracy of soil moisture inversion using remote sensing thermal inertial method and its applicability to covered vegetation area, the thermal inertia model is improved in this paper. As components in soil surface energy balance, soil sensible and latent fluxes are introduced into improved thermal inertial model. And in the covered vegetation area, the series two-layer is applied to eliminate impact by vegetation, and acquire soil sensible and latent heat flux under vegetation. Considering that, the pixel thermal radiation comes from both vegetation and soil heat radiation, the pixel temperature is divided into vegetation, soil under the vegetation, bare soil component temperature. Furthermore, In order to extend the scope of the thermal inertia model, B in the equation is derived from mechanism. At last, the improved thermal inertia were normalized, which is used to fulfill the inversion of soil moisture. The validation was carried out in the YingKe green land applying the ASTER data. The accuracy of soil moisture inverting using the improved thermal inertial model is obviously improved. The case study results show that the new method can effectively be used for regions with better-covered vegetation, which provides a new way of thinking for remote sensing thermal inertia methods to acquire soil moisture in arid and semiarid area.

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