APPROACHING FOR SETTING OF ATMOSPHERE'S PUTTING FUNCTION

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Using of Cosmic technique and technology are more productive for some quality in the solution of investigation of natural resources, their reporting, using them as rational and solving of environment and so on problem. Thus, this technology is characterized with globally of area, shortness of investigation period and also with possibility of application in hard condition.

The using of Earth and its coat by this method are based on ray reflected from objects and also itself special 2 measured dispensation measuring. Practically results receiving from this measuring keeps all information about studying object. In some problems of Remote Sensing between studying object and receiving device influence condition coming to signal from object. During getting satellite description receiving signal registries crossing from atmosphere, expose to atmosphere influence. Thus receiving signal isn't a signal coming from studying object, it's a signal transformed crossing from atmosphere. Its important to take account such influence for the purpose of recognizing exactly of objects during automatic processing of Cosmic images. Its important to defining atmosphere influence during any Remote image for changing of parameters characterized atmosphere and foreign influence. We'll look through problem of the definition of atmosphere's launching function at the same time with remote image.

Let's to see total scheme of Cosmic image making (Fig.1).In the researching area U signal coming from any source isn't *U* as in the image system, its noted as *v* transformed crossing the atmosphere.

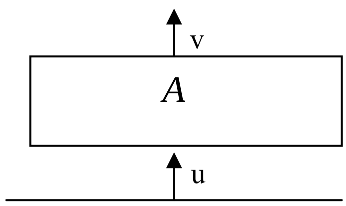

Fig. 1

On this condition atmosphere has to be seen as optic system. Then dependence between *u* and *v* must noted as follow:

$$Av=u \tag{1}$$

Here *A* is the transformation operator characterizing atmosphere. The task is to find *A* (identification) in *u* and *v* value.

We'll suppose signal coming from the same point in the different z and z_1 point and their time differences between measuring become enough little (picture 2). At this condition we can suppose atmosphere situation unchangeable in z and z_1 direction.

Crossing from the radiation medium its intensively is describes as deportation equation (1).

$$\frac{dI_\nu}{ds} = -\alpha_\nu I_\nu + \varepsilon_\nu \tag{2}$$

Here α_ν and ε_ν are mediums gain and medium's radiation factor. Its clear that for ε_ν their $\beta_\nu > 0$ is becomes $\varepsilon_\nu = \beta_\nu I_\nu$. Then (2) becomes as

$$\frac{dI_\nu}{ds} = -(\alpha_\nu - \beta_\nu) I_\nu \tag{3}$$

As in picture 2 under scheme (3) equation we get

$$I_{\nu}^{\downarrow}(0) = I_{\nu}^{\downarrow}(z)e^{-\tau_0} . \qquad (4)$$

Here $I_{\nu}^{\downarrow}(0)$ is radiation dropping to O point crossing from *z* height and atmosphere stratum, $I_{\nu}^{\downarrow}(z)$ is radiation dropping to *z* point, τ_0 is optic density of atmosphere.

During associating with object in earth surface $I_{\nu}^{\downarrow}(0)$ one part is swallowed by the object. Let's to sign this part with $k_1 I_{\nu}^{\downarrow}(0)$ .Then signal coming from object is becoming $I_{\nu}^{\downarrow}(0) - k_1 I_{\nu}^{\downarrow}(0)$.This signal turn to the (Fig. 2) in *z* point crossing from atmosphere as

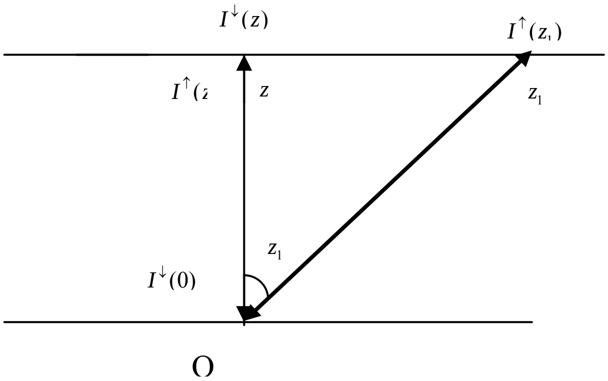

Fig. 2

$$I_{\nu}^{\uparrow}(z) = I_{\nu}^{\downarrow}(0)(1 - k_1)e^{-\tau_0} \qquad (5)$$

but in z_1 point becomes as

$$I_{\nu}^{\uparrow}(z) = I_{\nu}^{\downarrow}(0)(1 - k_1)e^{-\tau_0} .$$

Paying attention to $\tau_0 = -\int_0^z (\alpha_{\nu}(s) + \beta_{\nu})ds$ and $\tau_1 = \frac{\tau_0}{\cos z_1}$ we are get

$$I_{\nu}^{\uparrow}(z_1) = I_{\nu}^{\downarrow}(0)(1 - k_1)e^{-\frac{\tau_0}{\cos z_1}} \qquad (6)$$

But from (5) and (6) we get as follow:

$$\frac{I_{\nu}^{\uparrow}(z)}{I_{\nu}^{\uparrow}(z_1)} = e^{\frac{\tau_0(1-\cos z_1)}{\cos z_1}} .$$

But from this we get

$$\tau_0 = \ln \frac{I_{\nu}^{\uparrow}(z)}{I_{\nu}^{\uparrow}(z_1)} \cdot \frac{\cos z_1}{1 - \cos z_1} \qquad (7)$$

Setting function for specters ν diapason according to atmospheres height determines as $P_{\nu} = \frac{I_{\nu}(z)}{I_{\nu}(0)}$ [2]. Here $I_{\nu}(0)$ is in the earth's surface, $I_{\nu}(z)$ is fitting radiation to specters ν diapason in atmosphere *z* height. Then in picture 2 giving scheme becomes as (4) and (7)

$$P_{\nu} = \frac{I^{\downarrow}{}_{\nu}(z)}{I^{\downarrow}{}_{\nu}(0)} = e^{-\tau_0}$$

terms. Here is

$$\tau_0 = \ln \frac{I_\nu^{\uparrow}(z)}{I_\nu^{\uparrow}(z_1)} \cdot \frac{\cos z_1}{1 - \cos z_1} .$$

Paying attention to $I_\nu^{\downarrow}(0) = I_\nu^{\downarrow}(z) e^{-\tau_0}$ we get as follow:

$$I_\nu^{\uparrow}(z) = I_\nu^{\downarrow}(z) e^{-\tau_0} e^{-\tau_0} (1 - k_1)$$

or

$$I_\nu^{\uparrow}(z) = I_\nu^{\downarrow}(z) e^{-2\tau_0} (1 - k_1) .$$

But here we get

$$1 - k_1 = \frac{I_\nu^{\uparrow}(z) e^{2\tau_0}}{I_\nu^{\downarrow}(z)} \quad \text{or} \quad k_1 = 1 - \frac{I_\nu^{\uparrow}(z) e^{2\tau_0}}{I_\nu^{\downarrow}(z)} .$$

References

1. V.E. Zuev, M.V. Kabanov. Carrying over of optical signals in atmosphere. M: Soviet Radio. 1977.
2. M.S. Malkevich. The atmosphere account in problems of studying of natural resources. The earths from space. /In the book «Space researches of Terrestrial resources. M: Science. 1976.