

# Local heating of the Universe by the Higgs field

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We consider a possible regions in the Universe with different chemical composition, temperature, inner structure formed due to Higgs field interaction with a scalar field.

If Higgs field ( $h$ ) interacts with other scalar field ( $\phi$ ) with two vacua: true ( $\langle \phi \rangle$ ) and false  $\langle \phi' \rangle$ , then due to interaction of this field with Higgs the latter may have different v.e.v.,  $\langle h \rangle$  and  $\langle h' \rangle$ , depending on the vacuum of  $\phi$ . Region of the false vacuum of the field  $\phi$ , formed in the early Universe, is surrounded by domain wall which starts to collapse at some moment, when the temperature of matter  $T$ . It may lead to primordial black hole formation (PBH). Also when the particles intersect domain wall they change their mass since Higgs v.e.v. changed. If  $\langle h_0 \rangle \gg \langle h \rangle$ , then the mass is diminished, extra energy is released, the region is heated. If  $T \sim 1-100$  keV (soon after Big Bang nucleosynthesis), the considered region is order of galactic scale, and inside it and in its vicinity chemical composition should alter due to energy release. So in this scenario objects of galactic scale may appear with abnormal chemical composition, temperature, structure. Here we discuss it.

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