

## Transported materials from outflow channel to Northern lowland on Mars

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Outflow channels on Mars are known as the huge channels carved by large amount of water emanated from underground mainly during early Hesperian to early Amazonian era[1]. Most of them are concentrated around Cryse basin, for example Kasei Valles, Tiu Valles and Mangara Valles. They are starting from around the equator, extends toward north direction and flow into the Cryse basin which is northern lowland. Thus the water should have transported large amount of sediments from southern highland to northern lowland along the channel[2].

Recently the northern lowland was re-examined in a macro view utilizing MOLA(Mars Orbiter Laser Altimeter) boarded on MGS(Mars Global Surveyor) and was confirmed that large amount of deposit have resurfaced the Noachian old northern plane as Vastitas Borealis Formation(VBF) during Hesperian era[3]. Contrary in a micro view, many morphologies suggesting the existence of ground ice, such as patterned ground, pingo, viscous flow materials, are detected[4,5,6]. Thus many people think that the northern lowland was buried by the deposit derived from southern highland by the outflow channel activity, and still involving the water inside as ice state[7]. However, the exact amount of the source water emanated from the ground and the water now included in VBF are not still well clarified.

In our presentation, we compare the amount between the transported material by outflow channel activity and the deposit of VBF in northern lowland. We also estimate the minimum amount of water necessary to sweep away the transported material. Then we discuss the present fate of ancient water, for example how much water should be involved in VBF and dissipated into the atmosphere and Space.

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