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Estimation of Water Content in Vera Rubin Ridge and Glen Torridon areas Based on Measurements of the MSL/DAN Instrument in Gale crater

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This work presents the latest results on the estimations of Water Equivalent Hydrogen (WEH) gathered in martian areas Vera Rubin ridge (VRR) and Glen Torridon (GT) by the Dynamic Albedo of Neutron (DAN) instrument installed onboard NASA's Curiosity rover. The main science objective of DAN is to study bound water content in shallow layer of martian subsurface down to 0.6 m [1].

Extensive scientific campaign on Vera Rubin ridge was started in the middle of 2017 and lasted until the beginning of 2019 when the rover reached another region – Glen Torridon. VRR is mostly related to hematite minerals that might be formed in the presence of liquid water. On the other hand, GT region is thought to be associated with clay minerals, according to CRISM observations [2].

We will present the latest results on DAN passive observations in these Mars areas. Data are referred to the period of more than 3 years of observations or MSL traverse segment from 17 km to 23 km. The main result is the notable increase of WEH in GT in comparison with VRR, as well as in comparison with the whole Curiosity traverse. Possibly, the increase may indicate on the qualitative difference in neutron-absorption elements that are forming the soil of the GT region.

References:

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[2] *Murchie, S. L., et al. (2009), Compact Reconnaissance Imaging Spectrometer for Mars investigation and data set from the Mars Reconnaissance Orbiter's primary science phase, J. Geophys. Res., 114, E00D07, doi:10.1029/2009JE003344.*