



## **Subsurface water content in Gale crater from DAN measurements and its correlation with mineral abundance on the surface**

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The Dynamic Albedo of Neutrons (DAN) instrument designed to detect neutrons in order to determine hydrogen abundance in the Martian subsurface (down to 1 m deep) is successfully working onboard Mars Science Laboratory (MSL) rover Curiosity for more than 6 years. The Curiosity rover covered more than 19 km on the Martian surface and crossed a range of terrain types and geological structures of different mineralogical composition. We investigated the possible correlation between water content value as measured by DAN instrument along the Curiosity traverse and the presence of hydrated minerals as seen from orbit (for example, by Compact Reconnaissance Imaging Spectrometer for Mars instrument onboard Mars Reconnaissance Orbiter) in order to connect geochemical features of the surface to the subsurface water measurements. Our cross-analysis of soil water content from DAN passive measurements in Gale crater and special data sets, reflecting distribution of hydrated/hydroxylated minerals on the surface of this crater, shows an increase of the average water content for the surface containing certain types of minerals as related to the surface, which does not contain them. This increase is higher, with the more prominent spectral feature of the mineral on the surface. Thus, certain types of minerals being part of the sedimentary deposits composing the Gale crater surface have considerable thickness, which is sufficient for being detected by the DAN measurements.