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Thermal mapping of the martian surface

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Thermal data usefully complement other datasets used in geological interpretations, with the capability of mapping the distribution of rock types of distinct thermophysical properties, the activity and diversity of slope processes, the distribution of shallow ice and its seasonal variations, or variations of dust thickness. We illustrate some of these capabilities. Using THEMIS data, the apparent thermal inertia (ATI) and differential apparent thermal inertia (DATI) methods make it possible to map thermal inertia of the surface of Mars using available data only, with no data interpolation in contrary to conventional thermal inertia mapping, and is particularly efficient at mapping thermophysical contrasts on slopes > 10°. Using a database of 1,424,366 surface temperature retrievals from PFS distributed over 18438 Mars Express orbits covering 9 martian years (Ls=331.18° of MY 26 to Ls=21.17° of MY 34), seasonal surface changes can be tracked and characterised, for instance in polar caps