MARTIAN CLOUDS DETECTED BY OMEGA/MARS EXPRESS. B. Gondet[1], J.-P. Bibring[1], Y. Langevin[1], F. Poulet[1], F. Montmessin[2], F. Forget[3], [1]Institut d'Astrophysique Spatiale, CNRS/Université Paris Sud, Orsay, France, [2]Service d'Aéronomie, Verrières le buisson, France, [3]Laboratoire de Météorologie Dynamique, Paris, France.

Introduction: On board the ESA Mars Express Orbiter, OMEGA has mapped the surface and atmosphere of Mars over more than two Martian years. Its spectral capability enables to identify H_2O and CO_2 and to discriminate between their different states: vapour, clouds and frosts. With its imaging capability, OMEGA has the potential to monitor their time and space variations.

Water ice clouds: H_2O clouds are observed all over the Martian years, in a variety of locations. We will present the monitoring of their evolution, and discuss the results we obtained with reference to the predictions based on the GCM.

CO_2 clouds: A major discovery has been the detection of high altitude CO_2 clouds. It originates from the identification of a spectral signature resulting from a resonant absorption at 4.24 μm. These clouds are observed in very restricted locations, both in terms of time and locations. They are mostly present over the equatorial regions, at low longitudes, for durations that do not last more than weeks. Their altitudes, as derived both from modelling and stereoscopic observations by HRSC/Mars Express are typically of 80 km or more. The thermodynamical properties of the atmosphere at these locations are known to favour the formation of such clouds. However, they are not sufficient to account for the transient character of their appearance. Specific nucleation processes must be taken into account, with a key role likely played by nanograins still to be identified.

Conclusion: H_2O and CO_2 clouds are major contributors to the global atmospheric circulation processes. Through the monitoring of their evolution over Martian years, OMEGA contributes to understanding the microphysics involved, and of the H_2O and CO_2 cycles, keys to decipher clues of the present Martian climate.