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A far-ultraviolet and X-ray dominated region code including dust grain chemistry

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Understanding Astrochemistry is essential for disentangling the complex physical processes taking place in very different environments, such as regions where the energetic balance is dominated by UV radiation and AGNs. Meijerink & Spaans (2005) developed a PDR/XDR code (considering gas-phase chemistry only) to study this type of regions. Recently, we have significantly improved this code by including dust grain chemistry in order to determine the different conditions of the interstellar medium (gas/ice/dust) in regions characterised by high molecular gas densities and by the presence of strong radiation fields. In particular, we have included more than 100 reactions covering many processes, such as chemical desorption, freeze out, evaporation, reactivity on surfaces or in the ices and photo-desorption. Here we present the first results obtained with this new code and we discuss the impact of dust grains on the chemical composition of environments powered by UV/X-rays.

REFERENCES

Meijerink, R. & Spaans, M. (2005), A&A, 436, 397-409