

Chemistry associated to lightning

Lightning, one of the most experienced and most severe phenomena on Earth, is capable of producing approx. 10% of the annual greenhouse gas budget as well as energetic electron beams and terrestrial gamma-ray flashes (TGFs), beams of X- and gamma-rays with quantum energies of up to 40 MeV.

Currently, we are exploring how energetic electrons and photons could contribute to the production of greenhouse gases by activating the ambient atmosphere through excitations, dissociation and ionization.

The purpose of this project is to develop a code to model chemical reactions and tracing the temporal evolution starting from a few molecules leading to more complex molecules.

The project consists of literature study about the nature of lightning, TGFs and the associated chemistry as well as of developing the necessary codes to simulate chemical reactions, performing numerical simulations and conclusively post-processing of simulation results.

We at TU Dortmund study various phenomena related to lightning ranging from the very early microscopic conditions to macroscopic manifestations.

If we have caught your attention, please contact christoph.koehn@tu-dortmund.de to obtain more information.
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