

Decontamination of Space Equipment Using Cold Atmospheric Plasma

**M. Müller¹, Igor Semenov¹, J. L. Zimmermann², T. Shimizu², G.E. Morfill²,
P. Rettberg³, H. M. Thomas¹**

¹DLR-Forschungsgruppe Komplexe Plasmen, Argelsrieder Feld, Wessling 82234, Germany

²terraplasma GmbH, Lichtenbergstraße, Garching 85741, Germany

³DLR-Institut für Luft- und Raumfahrtmedizin, Linder Höhe, Köln 51147, Germany
e-mail: meike.mueller@dlr.de

Cold atmospheric plasma (CAP) is a very effective technology for the inactivation of microorganisms, which is of crucial interest for extraterrestrial space missions. In our study, a new designed plasma-gas circulation system has been developed and tested. The investigations with bioindicators (*Bacillus atrophaeus*) show that this technology has a high sterilization effect. Therefore, several treatment volumes were tested to optimize the CAP efficacy. In addition, we plan to perform a series of measurements for chemical composition by using a FTIR spectrometer. This provides an insight into the plasma chemistry including the influence of the humidity on the inactivation of microorganisms. In this contribution, we propose a possible design of decontamination system for larger spacecraft facilities using CAP. Furthermore we will discuss the advantage of CAP technology in comparison with conventional sterilization methods.