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### Atmospheric Environment

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## The effects of electric fields on charged molecules and particles in individual microenvironments

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### Abstract

Measurements of small air ion concentrations, electrostatic potential and AC electric field strengths were taken in an office setting to investigate the link between electric fields and charged molecule and particle concentrations in individual microenvironments. The results obtained indicate that the electromagnetic environments individuals can be exposed to whilst indoors can often bear little resemblance to those experienced outdoors in nature, and that many individuals may spend large periods of their time in "Faraday cage"-like conditions exposed to inappropriate levels and types of electric fields that can reduce localised concentrations of biologically essential and microbiocidal small air ions. Such conditions may escalate their risk of infection from airborne contaminants, including microbes, whilst increasing localised surface contamination. The degree of "electro-pollution" that individuals are exposed to was shown to be influenced by the type of microenvironment they occupy, with it being possible for very different types of

microenvironment to exist within the same room.

It is suggested that adopting suitable electromagnetic hygiene/productivity guidelines that seek to replicate the beneficial effects created by natural environments may greatly mitigate such problems.

**Keywords:** Air ions; Electric fields; Microbes; Charged ultrafine particles



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