

Kolloquium

Biomedizinische Technik und verwandte Gebiete

Wintersemester 2018

Freitag, 09. November 2018, 10:00 – 11:30 Uhr

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(Moderation: Univ.-Prof. Dr.-Ing. Dr. med. Steffen Leonhardt,
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„Multi-frequency Electrical Impedance Tomography for Monitoring Lung Diseases“

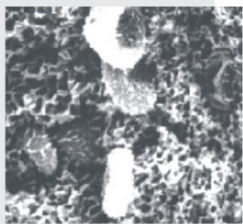
Abstract:

Patients lying in the intensive care unit (ICU) suffering from lung diseases typically need supportive care with mechanical ventilation. For successful therapy, correct diagnosis of the diseases and the continuous monitoring of the lung condition is essential.

The established clinical methods to assess lung condition are typically based on blood gas analysis (BGA) and on radiological technologies. Although these are very important diagnosing tools, BGA-based parameters only provide information about the general healthy condition of the patient, and CT scans are potentially harmful due to radiation and are not available at the bedside.

A promising alternative is based on the injection of harmless currents and measurement of resulting voltages at the thorax surface, the so-called electrical impedance tomography (EIT). Since it is a harmless and non-invasive technology, it can be used for continuous monitoring at the bedside.

This work covers several contributions to the field of multi-frequency EIT (mfEIT) for monitoring of lung diseases. These range from the development of a new mfEIT system, through the introduction of new imaging methods and indices, to the evaluation of the EIT technology in diverse lung pathologies. The animal trials carried out comprised the detection of fluid content in the lung, the monitoring of lung contusion, and the monitoring of lung pathologies associated with acute respiratory distress syndrome (ARDS).



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