How Physics helps Neurosurgery in daily life

Jakob Marquardt
Universität Tübingen

Abstract

Over the last decades several key developments in medical technology have helped to improve diagnostics and therapy in clinical medicine. In the neurosurgical field various technologies have been successfully employed to optimize the treatment outcome. Examples are structural and functional imaging modalities for preoperative planning as well as intraoperative navigation and surgical dissection.

The operating microscope as the pivotal instrument for the microsurgical technique has been augmented with fluorescence imaging and integration of the digital image processing chain. In this colloquium, certain key assistance technologies in daily neurosurgical use are presented and discussed from a clinical standpoint including the underlying physical mechanisms.