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Multi-channel Chip-Scale Atomic Magnetometry ORANG ALEM, National Institute of Standards and Technology, Boulder CO, USA, TILMANN H. SANDER, Physikalisch-Technische Bundesanstalt, Berlin, Germany, JOHN J. LE BLANC, Charles Stark Draper Laboratory, Inc., Cambridge MA, USA, RAHUL MHASKAR, JOHN KITCHING, National Institute of Standards and Technology, Boulder CO, USA, LUTZ TRAHMS, Physikalisch-Technische Bundesanstalt, Berlin, Germany, SVENJA KNAPPE, National Institute of Standards and Technology, Boulder CO, USA — We characterize a 25-channel microfabricated atomic magnetometry system. Each fiber-coupled sensor head contains a $(1.5\text{mm})^3$ Rb vapor cell and is pumped and probed with a single light beam from a diode laser. The magnetic sensitivities of all sensors range between 15 and 35 fT/ $\sqrt{\text{Hz}}$ at 10-100 Hz. The sensors require around 70 mW of power and are optically heated through the absorption of light on the windows of the cells. The small size ($< 1 \text{ cm}^3$) of the fiber coupled, uncooled sensor heads provides great flexibility in the placement of these sensors in conformal configurations for various imaging applications. As one example, we will present measurements of magnetoencephalography (MEG) and magnetocardiography (MCG) with this system that were taken on healthy human subjects.

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