

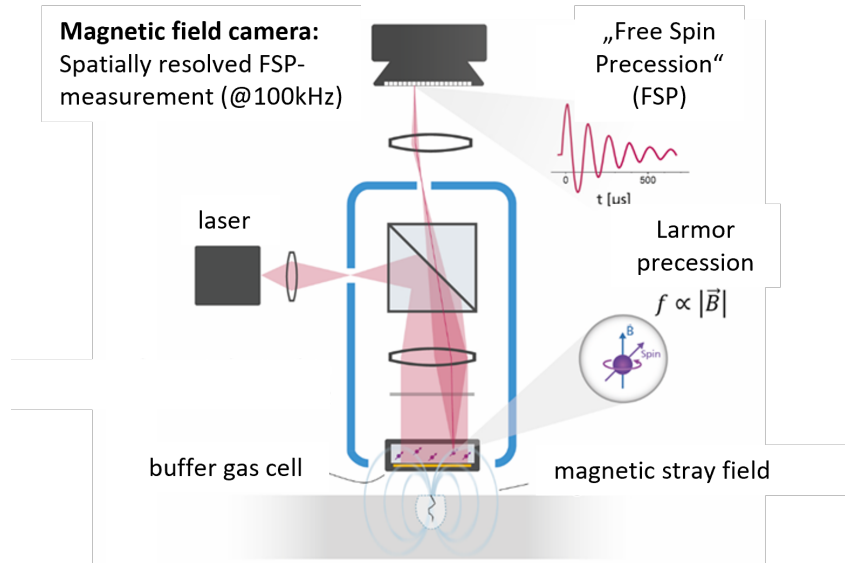
# Approaching an optically pumped free-spin-precession magnetometric camera

Jeremias Gutekunst<sup>1</sup>, Ronja Rasser<sup>1,2</sup>, Patrick Laux<sup>1</sup>, Andreas Blug<sup>1</sup>, Peter Koss<sup>1</sup>

<sup>1</sup>Fraunhofer Institute for Physical Measurement Techniques IPM, Germany

<sup>2</sup> University of Freiburg, Germany

We are developing a high sensitivity magnetic field camera for detecting defects in metal components. Our approach leverages the high sensitivity and robustness of free-spin-precession (FSP), combined with a fast camera operating at 100kHz. Unlike current state-of-the-art optically pumped magnetometers (OPM), which record single or few data points within the probe's volume, we plan to image the entire surface of the Rubidium cell directly onto the camera. This method will allow us to read out spatially resolved magnetic field strengths in parallel, rather than measuring the spatially averaged oscillating transmission of a probe laser through the cell.



**Figure 1.** A circularly polarized laser illuminates a buffer gas cell. Inside, rubidium atoms precess around a magnetic stray field with the Larmor frequency  $\omega_L$ . The entire surface of the cell is imaged onto a camera thereby allowing for a spatially resolved measurement of the field distribution.