Effect of Magnetic Field on Deflection of an Optical Fiber Combined with a Microwire

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Abstract. We investigate the effect of a stationary magnetic field created by a neodymium permanent magnet on the deflection of an optical fiber, at the end of which an 8 mm long amorphous $Fe_{76}Si_9B_{10}P_5$ microwire is attached. We bring the magnet closer to the optical fiber with the microwire and move it away from the fiber in a defined manner in a direction perpendicular to the axis of the optical fiber. We monitor the deflection of the fiber with the microwire by monitoring the change in the optical signal that passes from the optical fiber with the implemented microwire to the detection optical fiber through an air gap with a width d_v. From the change in the transmitted optical power depending on the position of the magnet, we infer the sensitivity of the system and further discuss the influence of various parameters on this sensitivity. The prepared element can, potentially be used for the optical measuring of magnetic fields and investigation of magnetic field inhomogeneities.