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Paper: Brillouin frequency shift of standard optical fibers set in water vapor medium

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Abstracts: The dependence of the Brillouin frequency shift (BFS) on UV-cured acrylate coating and uncoated fibers for media that have different water vapor concentrations is experimentally investigated. The BFS is proportional to the temperature within the fiber, but it also depends on the water vapor contained in the surroundings of the fiber. A hypothesis based on the efficiency of the heat transfer due to the different humidity concentration in the media is proposed, and the temperature difference that depends on the heat transfer is quantified in standard fibers. A shift of 0.22 MHz for relative humidity change between 60% and 98% at 20°C is measured