During the past years, cricket-inspired hair flow sensors have been developed successfully in our group using MEMS-technology. The current generation sensors allow for measurement of air flow velocities down to sub-mm/s. To improve the performance of these flow sensors even further, we will use non-linear effects.

On application of parametric amplification using AC-bias voltages, the sensory system allows for sharp tunable filtering and amplification. Also, low-frequency flow signals can be upconverted to higher frequencies using electromechanical amplitude modulation. With the use of DC-bias voltages, both models and experiments show that the sensor's responsivity can be enhanced. Next, with a modified design for the flow sensors, it is expected that noise can be used to improve the sensor's Signal-to-Noise Ratio (SNR) by the mechanism of stochastic resonance.

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People involved: TST: Gijs Krijnen (Prof.), Harmen Droogendijk (Ph.D.)

Publications

{php}readfile("http://eprints.eemcs.utwente.nl/view/project/BioEARS.include");{/php}