

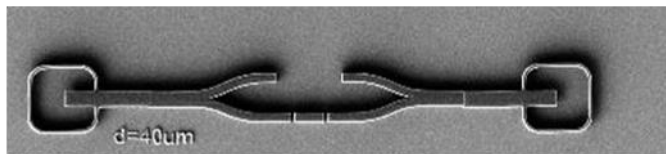
## POLYMER BASED MACH-ZEHNDER INTERFEROMETER FOR ON-CHIP SENSING APPLICATIONS

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Point-of-care diagnosis leads to integration of sensors, electrical and optical components in one device and opened the new area of lab-on-a-chip (LOC) devices where all operations and analysis are realized on a single chip. In LOC applications, the optical components based on interference principles play also important role. The Mach-Zehnder Interferometer (MZI) is well-known photonic device from on-chip applications especially used in the field of silicon photonics.

We proposed design of symmetric MZI based on polymer IP-Dip. The sensing part of MZI is arranged directly in the core part of the sensing arm. By use of the laser lithography system MZIs with interrupted region in sensing arm were designed and fabricated (Fig. 1). Prepared MZIs were used for high sensitive refractive index change detection by measurement of different sucrose/water solutions. The proposed MZI have great potential for precise optical measurements of sucrose concentrations in human blood.



*Fig. 1 Scanning electron microscope image of the MZI with interrupted region of length 40  $\mu\text{m}$  in the sensing part and 2  $\mu\text{m}$  double interruption in the reference arm.*

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