Applied Physics & OSA

Optics Seminar

Two Dimensional Photonic Crystal Structures for Biosensing Applications

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I will present the design, performance and applications of a passive 2D photonic crystal resonator used as a chemical sensor. Photonic crystal materials have many unique properties such as engineered dispersion and strong optical confinement. These properties have been used to confine light to very small volumes by altering the size of only one hole in an otherwise periodic lattice of holes. Commercially available chemical sensors based on surface plasmon resonance or liquid chromatography typically require large surface area (~1mm^2) and microliters of analyte in order to achieve detection limits of Δn~1e-7 (corresponding to a concentration of ng/mL). On the other hand, the volume occupied by the holes of the photonic crystal resonator is over 6 orders of magnitude smaller. Such small volumes suggest the application of photonic crystal sensors to single-molecule-detection experiments: an area of strong current interest to biologists. In this presentation I discuss the performance and design considerations for photonic crystal devices as sensors for biomolecular interaction analysis. I will also give a brief overview of the different businesses with Agilent and some of the other work at Agilent Labs in the area of photonics.

Biography:

Dr. Annette Grot received her Ph.D. from Caltech in 1994. She is the project manager for integrated nanoscale photonic circuits within the communications and optics research lab and the lead inventor at Agilent Laboratories.

Monday, November 22, 2004.
12:00pm-1:00pm.
Moore 080

Pizzas will be available at the seminar.