# Local analysis for locating a point target in time-domain fluorescence diffuse optical tomography

Junyong Eom

The time-domain fluorescence diffuse optical tomography (FDOT) is to recover the distribution of fluorophores in biological tissue from the time domain measurement on the boundary. The measurement is conducted by several pairs (S-D pairs) of a point source and a point detector. In this talk, we identify the location of the distribution of fluorophores over a point, refer as a point target. For that we first give an expression of solution for the forward problem in a dimensionless form and consider its asymptotic expansion. Then, we theoretically investigate what is the minimal number of S-D pairs to determine the point target location, analyzing the determinant of sensitivity matrix. Finally, we numerically verify the invertibility of the matrix and demonstrate the local solvability for locating the point target.