Quantitative and localized spectroscopy for non-invasive bilirubinometry in neonates

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# List of symbols

### General symbols
- **t**: time
- **f**: frequency
- **λ**: wavelength
- **k**: wave number
- **d**: depth
- **ε**: geometrical path length
- **Δλ**: wavelength resolution
- **Δk**: wave number resolution
- **Δf**: frequency resolution
- **hv**: photon energy
- **Ø**: diameter
- **r**: radius
- **D**: thickness
- **μt**: attenuation coefficient
- **μa**: absorption coefficient
- **μs**: scattering coefficient
- **μ 현**: reduced scattering coefficient
- **μb**: backscattering coefficient
- **μb,NA**: NA-corrected μb
- **μeff**: effective attenuation coefficient
- **p(θ)**: scattering phase function
- **g**: scattering anisotropy
- **n**: refractive index
- **n_ge**: group refractive index
- **a**: scattering scaling factor
- **b**: scatter power
- **c**: chromophore concentration

### Optical properties
- **I**: spectral intensity
- **R**: remittance
- **r_j**: fiber distance from source
- **z_0**: modeled source position
- **z_b**: modeled virtual source position
- **A**: empirical parameter
- **α**: proportionality factor
- **β, γ**: validity limiting parameters

### Diffusion theory
- **I_s**: electric field in the sample arm
- **E_R**: electric field in the reference arm
- **E_0**: electric field at the detector
- **I_s**: sample arm intensity
- **I_R**: reference arm intensity
- **i_0**: photo detector current
- **i_ac**: AC photo detector current
- **S**: power spectrum

### LCS system and geometry
- **x_s**: sample arm length
- **x_R**: reference arm length
- **ΔL**: optical path length difference
- **λ_0**: center wavelength
- **λ_FWHM**: wavelength bandwidth
- **l_c**: coherence length
- **S_0**: source power spectrum
- **T_c**: system coupling efficiency
- **ζ**: system calibration constant
- **α**: scaling factor
- **ε_f**: focus position in path length units
- **Z_R**: Rayleigh length
- **w**: beam waist
- **Q**: solid angle
- **θ**: (focusing) angle
- **M**: number of modes

### LCS acquisition
- **Δx_s**: sample arm displacement
- **Δx_R**: reference arm displacement
- **ν_R**: reference mirror velocity
- **f_R**: reference mirror scanning frequency
- **ΔR**: reference mirror scanning amplitude
- **Δε**: path length scanning window
- **N**: number of samples
- **f_s**: sampling frequency

### Brownian motion
- **Δf_D**: Doppler frequency shift
- **k_B**: Boltzmann constant
- **T**: temperature
- **η**: viscosity

### LCS spectroscopic detection
- **η_s, η_R**: sample/reference arm fraction
- **d_max, ΔL_max**: imaging depth/path length
- **Δκ, Δλ**: spectrometer pixel width
- **N_p**: # pixels
- **τ**: integration time
- **f_D**: Doppler frequency
- **ε**: detection efficiency
- **Δε_R**: reference mirror scanning window
- **Δε_s**: spectrograph probing window

(bold-faced printed characters in this thesis denote wavelength dependent parameters)