# Biomedical Optics: Principles and Imaging
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**Readers:**

1.      Please submit typographical errors or comments to
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2.      Please visit http://oilab.seas.wustl.edu (may change to http://oilab.wustl.edu) for a taped
        tutorial on Biomedical Optics.


## May 17, 2007

**Erratum to First (May 2007) Print:**

Eq. (9.51):
Replace *x* with *r* in the numerator.

Second paragraph below Eq. (9.83), page 202:
"… measure the second term" should be "… measure the third term"

Problem 7.6:
Replace "of this fluctuation" with "of the number of received photons due to this fluctuation".

Eq. (10.6):
Change arctan to $\text{arctan}_2$.

After "where $0 \leq \theta_o < \pi$ .", add the following sentence:
"Here, $\text{arctan}_2$ denotes four-quadrant inverse tangent, yielding an angle depending on the
quadrant of $\left( E_{x0}^2 - E_{y0}^2, \quad \cos \Delta\phi \right)$."

Below Eq. (10.7):
Replace "major and minor" with "semimajor and semiminor".
Replace "right- and left-handed" with "left- and right-handed".

Above Eq. (10.24):
Replace $E_{0x} = E_{0y}$ with $E_{x0} = E_{y0}$.

Eq. (10.27):
Swap signs so that

$$\mathbf{M}_r(\theta) = \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & \cos 2\theta & -\sin 2\theta & 0 \\ 0 & \sin 2\theta & \cos 2\theta & 0 \\ 0 & 0 & 0 & 1 \end{pmatrix}$$

Eq. (10.32):
Swap signs so that

$$\mathbf{M}_\phi = \begin{pmatrix} 1 & 0 & 0 & 0 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & \cos\phi & \sin\phi \\ 0 & 0 & -\sin\phi & \cos\phi \end{pmatrix}.$$

Eq. (10.33):
Swap signs so that
$$\mathbf{M}(\theta) = \mathbf{M}_r(\theta)\mathbf{M}(0)\mathbf{M}_r(-\theta)$$

Above Eq. (10.34):
Change from $\phi = \pi/2$ to $\phi = -\pi/2$.

Below Eq. (10.42):
Change from $\phi = -\pi/2$ to $\phi = \pi/2$.

Eq. (10.55):
Swap signs so that
$$\mathbf{J}_r(\theta) = \begin{pmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{pmatrix}$$

Eq. (10.57):
Swap signs so that
$$\mathbf{J}_p(\theta) = \mathbf{J}_r(\theta)\mathbf{J}_p(0)\mathbf{J}_r(-\theta)$$

Eq. (10.60):
Swap signs so that
$$\mathbf{J}_\phi(\theta) = \mathbf{J}_r(\theta)\mathbf{J}_\phi(0)\mathbf{J}_r(-\theta)$$

Eq. (10.96):
Swap signs so that

$$\mathbf{U} = \frac{1}{\sqrt{2}} \begin{pmatrix} 1 & 0 & 0 & 1 \\ 1 & 0 & 0 & -1 \\ 0 & 1 & 1 & 0 \\ 0 & -i & i & 0 \end{pmatrix}$$

Eq. (11.10):
Remove time dependence so that
$$U(\vec{r},t)=U_{DC}(\vec{r})+U_{AC}(\vec{r})\exp(-i\omega t).$$

Below the equation, change $U_{AC}(\vec{r},t)$ to $U_{AC}(\vec{r})$.

Example 11.1:
Below "figure(2)" in the MATLAB file is redundant.

Below Eq. (11.40):
Change from "$h$ is the side of each grid element" to "$h$ is the side length of each grid element".

Eq. (12.29):
Correct to
$$p_0(\vec{r}')=\Gamma H_s(\vec{r}')$$