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Core Faculty Profile

Xu Li

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Xu Li

Research Interests

- Optical imaging and diagnosis techniques for biomedical applications
- Nanophotonic devices
- Electrodynamics of random media, especially in biological tissues and nanophotonics structures
- Computational electrodynamics
- Microwave imaging and sensing techniques for biomedical applications

Selected Publications

1. X. Li and S. C. Hagness, "A confocal microwave imaging algorithm for breast cancer detection," *IEEE Microwave and Wireless Components Letters*, vol. 11, no. 3, pp. 130-132, March 2001.
2. X. Li, S. C. Hagness, M. K. Choi, and D. W. van der Weide, "Numerical and experimental investigation of an ultrawideband ridged pyramidal horn antenna with curved launching plane for pulse radiation," *IEEE Antennas and Wireless Propagation Letters*, vol. 2, pp. 259-262, 2003.
3. X. Li, Z. Chen, J. Gong, A. Taflove, and V. Backman, "Analytical techniques to address the forward and inverse problems in light scattering by irregularly shaped particles," *Optics Letters*, Vol. 29, pp. 1239-1241, 2004.
4. X. Li, Z. Chen, A. Taflove, and V. Backman, "Equipphase-sphere approximation for analysis of light scattering by arbitrarily-shaped nonspherical particles," *Applied Optics*, Vol. 43 (23), pp. 4497-4505, 2004.
5. X. Li, S. K. Davis, S. C. Hagness, D. W. van der Weide, and Barry D. Van Veen, "Microwave imaging via space-time beamforming: Experimental investigation of tumor detection in multilayer breast phantoms," *IEEE Transactions on Microwave Theory and Techniques*, Vol. 52 (8), pp. 1856-1865, 2004.
6. X. Li, Z. Chen, A. Taflove, V. Backman, "Equipphase-sphere approximation for light scattering by stochastically inhomogeneous particles," *Phys. Rev. E*, Vol. 70 (5), 056610, 2004.
7. X. Li, Z. Chen, A. Taflove, and V. Backman, "Optical analysis of nanoparticles via enhanced backscattering facilitated by 3-D photonic nanojets," *Optics Express*, Vol. 13 (2), pp. 526-533, 2005.
8. X. Li, A. Taflove, and V. Backman, "Modified FDTD near-to-far field transformation for improved backscattering calculation of strongly forward-scattering objects," *IEEE Antennas and Wireless Propagation Letters*, Vol. 4, pp. 35-38, 2005.
9. X. Li, A. Taflove, and V. Backman, "Quantitative analysis of the depolarization of

backscattered light by stochastically inhomogeneous dielectric particles," *Optics Letters*, Vol. 30, pp. 902-904, 2005.

10. **X. Li**, E. J. Bond, S. C. Hagness, and B. D. Van Veen, "An overview of ultrawideband microwave imaging for early-stage breast cancer detection via space-time beamforming," *IEEE Antennas and Propagation Magazine*, Vol. 47, pp. 19-34, 2005.
11. Y. Liu, **X. Li**, Y. Kim, and V. Backman, "Elastic backscattering spectroscopic microscopy," *Optics Letters*, Vol. 30, pp. 2445-2447, 2005.
12. **X. Li**, A. Taflove, and V. Backman, "Recent progress in exact and reduced-order modeling of light-scattering properties of complex structures," *IEEE Journal of Selected Topics in Quantum Electronics on Biophotonics*, Vol. 11, no. 4, pp. 759-765, 2005.
13. J. Gong, B. Liu, Y. Kim, **X. Li**, V. Backman, "Wavelength Synthesis for Optimizing the Resolution of Optical Coherence Tomography", *Optics Express*, Vol. 14, No. 13, 5909-5915, 2006.
14. A. Heifetz, K. Huang, A. V. Sahakian, **X. Li**, A. Taflove, V. Backman, "Experimental confirmation of superenhanced backscattering induced by a photonic nanojet", *App. Phys. Lett.*, Vol. 89, 221118, 2006.
15. **X. Li**, A. Taflove, V. Backman, " Anomalous oscillations in the spectra of light backscattered by inhomogeneous microparticles", *Phys. Rev. E*, Vol. 75, 037601, 2007

For additional information, visit <http://www.ece.northwestern.edu/~xli>



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