

Laser-induced breakdown spectroscopy (LIBS) is an attractive technique for field analysis of samples thanks to portable and remote/stand-off instruments and [1] and reduced requirements for sample preparation. Recent development of short-pulse lasers have improved this technique by increasing resolution by reducing the signal convolution with plasma effects (Lorentzian and Gaussian broadening). This new technique allows for evaluation of extremely thin films and residues.

Proposed papers to evaluate:

- Elhassan, A., Giakoumaki, A., Anglos, D., Ingo, G. M., Robbiola, L., & Harith, M. A. (2008). Nanosecond and femtosecond Laser Induced Breakdown Spectroscopic analysis of bronze alloys. *Spectrochimica Acta Part B: Atomic Spectroscopy*, 63(4), 504–511. <https://doi.org/10.1016/J.SAB.2008.02.003>
- Hwang, D. J., Jeon, H., Grigoropoulos, C. P., Yoo, J., & Russo, R. E. (2007). Femtosecond laser ablation induced plasma characteristics from submicron craters in thin metal film. *Applied Physics Letters*, 91(25), 251118. <https://doi.org/10.1063/1.2825289>
- De Lucia, F. C., Gottfried, J. L., & Miziolek, A. W. (2009). Evaluation of femtosecond laser-induced breakdown spectroscopy for explosive residue detection. *Optics Express*, 17(2), 419. <https://doi.org/10.1364/OE.17.000419>
- Zorba, V., Mao, X., & Russo, R. E. (2010). Optical far- and near-field femtosecond laser ablation of Si for nanoscale chemical analysis. *Analytical and Bioanalytical Chemistry*, 396(1), 173–180. <https://doi.org/10.1007/s00216-009-3136-7>
- Galmed, A. H., Kassem, A. K., Von Bergmann, H., & Harith, M. A. (2011). A study of using femtosecond LIBS in analyzing metallic thin film–semiconductor interface. *Applied Physics B*, 102(1), 197–204. <https://doi.org/10.1007/s00340-010-4144-1>

References:

- [1] F. J. Fortes and J. J. Laserna, “The development of fieldable laser-induced breakdown spectrometer: No limits on the horizon,” *Spectrochim. Acta Part B At. Spectrosc.*, vol. 65, no. 12, pp. 975–990, Dec. 2010.