Research Highlight Archive

Original use of a direct injection high efficiency nebulizer for the stand spray flames
R. Lemaire, M. Maugendre, T. Schuller, E. Therssen and J. Yon

It is of practical importance to lead laboratory-scale experiments allowing a t impact of commercial fuels composition on the formation of combustion resi this end, a hybrid burner has been designed recently to burn high-speed spr droplets.

Rev. Sc

A method for correlating in vivo prostate magnetic resonance imaging individualized magnetic resonance -based molds
Vijay Shah, Thomas Pohida, Baris Turkbey, Haresh Mani, Maria Merino, Pe and Marcelino Bernardo

A method for the design and rapid manufacture of a patient specific tissue si images in order to facilitate the process of correlating the images with histop resulting histological specimens demonstrate good anatomical correlation w

Rev. Sc

The integration of real and virtual magnetic resonance imaging experiments
Jonathan C. Sharp, Donghui Yin, Richard H. Bernhardt, Qunli Deng, Andrew Kan Lo, and Boguslaw Tomanek

We present the design of an integrated system for performing both real and resonance imaging (MRI) experiments. We emphasize the approaches usec integration and also the benefits that tight real-virtual integration brings for a

Rev. Sc

A compact apparatus for studies of element and phase-resolved ferromagnetic resonance
D. A. Arena, Y. Ding, E. Vescovo, S. Zohar, Y. Guan, and W. E. Bailey

We present a compact sample holder equipped with electromagnets and high frequency transmission lines; the sample holde ray magnetic circular dichroism and ferromagnetic resonance measurements. Several applications of the combined technique the flexibility of the experimental design.
Imaging fingerprint corrosion of fired brass shell casings

J. W. Bond

A newly developed method is presented for imaging fingerprint sweat corros that reduces the degradation of the corroded fingerprint image. Degradation calculating a maximum angle of contact between the shell casing and a plan imaging medium (graphite particles).

High resolution digital camera for infrared reflectography

Charles M. Falco

This paper describes the characteristics of a high resolution infrared (IR) im: nonspecialists can obtain IR reflectograms of works of art in a museum envi illustrated with an example that reveals important new information about the century artist.

Generation of Mie size microdroplet aerosols with applications in laser-driven fusion experiments

A. P. Higginbotham, O. Semonin, S. Bruce, C. Chan, M. Maindi, T. D. Donnelly, M. Maurer, W. Bang, I. Churina, J. Osterholz T. Ditmire
A terawatt Ti:Al2O3 laser focused to 2×1019 W/cm2 was used to irradiate hexane composed of micron-scale droplets. Energetic deuterium ions, which were generated by laser interaction, produced deuterium-deuterium fusion with approximately 2×103 joules of incident laser energy.

**Light emitting diode fault detection using p-n junction photovoltaic effect**

Ping Li, Yumei Wen, Youhai Cai, and Lian Li

An online noncontact fault detection method during light emitting diode (LED) operation is proposed. Through characterization of the p-n junction photovoltaic effect in a lead frame with 20 LED chips, five LED faults, including chip contamination and bonding deficiencies (disconnection, debonding, and reconnection before packaging), were detected.

**Quantification of unsteady heat transfer and phase changing process in a droplet**

Zheyan Jin and Hui Hu

The transient behavior of the phase change process within small icing water droplets was studied using molecular tagging thermometry. Such measurements improve our understanding of phenomena pertinent to ice formation and accretion processes on turbine blades.

**A multimodal spectroscopy system for real-time disease diagnosis**

Obrad R. Šćepanović, Zoya Volynskaya, Chae-Ryon Kong, Luis H. Galindo, Michael S. Feld

The combination of reflectance, fluorescence, and Raman spectroscopy—a multimodal spectroscopy (MMS)—provides complementary and depth-sensitive information about tissues. MMS is a promising tool for disease diagnosis, particularly in atherosclerosis. Promising results were obtained using an integrated MMS instrument and optical fiber spectral probe for three modalities in a clinical setting.

**Micro-differential thermal analysis detection of adsorbed explosive molecules on microfabricated bridges**

Larry R. Senesac, Dechang Yi, Anders Greve, Jan H. Hales, Zachary J. Davison, and Thomas Thundat

A micro-differential thermal analysis technique can be used to differentiate between nonexplosives and additionally differentiate individual explosive vapors such as pentaerythritol tetranitrate, and cyclotrimethylenetrinitramine. This technique offers direct detection with a limit of detection of 600 x10−12 g.