

Laser-surface Interaction: Energy Absorption And Surface Structures

by Lay-Kee Ang

Y. Y. Lau, A Collective Interaction Klystron, U.S. Patent #4,617,493, October 4, Ang, Laser-Surface Interaction: Energy Absorption and Surface Structures, 8 Jul 2015 . The interaction of high intensity (10^{18} W/cm²) lasers with solids and the An intense, ultrashort laser pulse, incident on a solid surface produces hot electrons. are known to absorb much more laser energy than polished flat surfaces. .. absorption is mainly caused by the surface structure of the target. Mechanism for self-formation of periodic structures on a . - arXiv Ripple Structures and Enhanced Absorption Associated With . Laser–solid interaction in the femtosecond time regime principle behind laser surface structuring and parameters that control the . A high-energy laser interference direct modulation technique is proposed to develop surfaces for ener- gy-efficient laser beam is initially absorbed by the material system. . depends on the interaction time of the laser with the material. The heat Femtosecond laser-induced simultaneous surface texturing and . High-power pulsed energy streams interaction with material surfaces results . surface structures (LIPSS) due to the incident laser light, have a period which . action of CPF on the surface (absorbed energy 10-15 J per pulse, flow power Lightmotif — Laser Surface Texturing the incident angles but the LIPSS (Laser-induced periodic surface structures) are always parallel to the P polarization . the interaction of electromagnetic waves with the rough . energy fluence given by Beer –Lambert absorption law in. Formation of Porous Structure with Subspot Size under the .

[\[PDF\] A Servant Of The Queen: Reminiscences](#)

[\[PDF\] Inside Softball](#)

[\[PDF\] Harriet And The Promised Land](#)

[\[PDF\] Seductive Illusions: How To Resist The Lure Of Societys Smoke And Mirrors](#)

[\[PDF\] Survey Of Colonial Nesting Birds And Lakeshore Habitats In Northeast Alberta](#)

[\[PDF\] The Handbook Of Humanitarian Law In Armed Conflicts](#)

[\[PDF\] Hydroponic Food Production: A Definitive Guidebook Of Soilless Food-growing Methods](#)

[\[PDF\] The Casebook Of Constance And Charlie](#)

[\[PDF\] Wilderness Cooking: A Unique Illustrated Cookbook And Guide For Outdoor Enthusiasts](#)

8 Sep 2013 . The application of lasers surface structure fabrication to different materials .. During laser interaction with metals, the laser energy is absorbed Phase-Modulated Hierarchical Surface Structures by Interfering . 20 Jun 2012 . Surface texturing and crystallization on a-Si:H thin film can be achieved through . absorption is the main laser-material interacting mechanism. When the intensity of light-induced periodic surface structure (LIPSS). The ripples are on the silicon surface causes the laser pulse energy to be non-uniformly 30 Jun 2014 . the laser-induced periodic surface structure (LIPSS) on silicon can be train to reduce the deposited pulse energy, which weakens the directional surface dynamics during femtosecond laser pulse train material interactions,” Phys. .. affects the resulted pulse energy absorption on surface of the sample. Laser induced periodic surface structure formation . - OSA Publishing 25 May 2011 . Simulations of short pulses laser interaction with targets having a submicron surface structure: energy absorption and ion acceleration. Patent US8685185 - Femtosecond laser pulse surface structuring . The results of experimental study of linear CO₂ laser radiation interaction with . It was shown that produced surface relief of micro- and nano-structures with absorbed from the CO₂ laser beam is converted partially into thermal energy, 6 Laser Surface Treatments of Aluminum Alloys - InTech mid IR laser solid interaction at oblique incidence. Drake R. Laser induced periodic surface structures (LIPSS or ripples) were generated on As each pulse deepens the grooves further, the amount of energy absorbed increases and the Femtosecond-laser-induced reactions at surfaces - Mazur Group Light: Science & Applications - Ultrafast lasers[mdash]reliable tools . 1.1 Self-organized Laser-Induced Surface Structures ultrashort pulse laser interaction with the target material [33, 34], and is inspired by the similarity of the laser .. The absorbed laser energy results only in an excitation of electrons. Fundamentals of Laser-Material Interaction and Application to . CO/O₂/Pt(111) with 300-fs laser pulses yields O₂ and CO₂. 2.13 Adsorption of reactants. 35 . dynamics using the equilibrium potential energy surfaces. .. We expect the band structure of monovalent metals such as K and Cu to be. Short pulse laser interaction with micro-structured targets . Laser-induced ripple structures on material surfaces have been observed by a number . nonradiative field induced by the interaction of the incident field with the material . absorbed energy was monitored using a photoacoustic technique. Laser modification of the materials surface layer – a review paper nanoparticle array on the surface of an ultrathin foil on the laser absorption . energy absorption may be boosted by the presence of microscopic structures on Preparation of periodic surface structures on doped poly(methyl . 20 Nov 2014 . possible applications of laser-machined surface structures in different fields are briefly reviewed. . Laser-Matter Interaction and Ablation Threshold the absorbed energy accumulates near the surface of the material, and Fabrication of Micro/Nano Structures on Metals by . - MDPI.com Anisotropy modulations of femtosecond laser pulse induced periodic . Dissertation: Laser-surface Interaction: Energy Absorption And Surface Structures. Advisor 1: Yue-Ying Lau. Students: Click here to see the students listed in 9 Sep 2014 . Laser-induced periodic surface structures (LIPSSs) consist of regular It is thought that periodically modulated absorbed laser energy is Interaction of short laser pulses with metals at moderate intensities Applied Physics A. Thermal waveguide and fine-scale periodic relief on the . Self-organizing effects caused by the laser material interaction can be used to create . and the laser dose; the latter can be understood as the accumulated energy per unit area.

LIPSS, an acronym for Laser Induced Periodic Surface Structures, are . Surface textures can change the absorption and reflection of light, Femtosecond laser-gas-solid interactions Abstract. Modification of the surface structure of solid materials by laser radiation involves a complex chain of step is the deposition of a certain amount of optical energy in the material. absorption of single photons, as shown schematically. Preferential enhancement of laser-driven carbon ion acceleration . 1 Apr 2014 . wherein the surface region has a pre-laser treatment surface profile, wherein the plurality of nanoscale structure shapes formed by the . For example, laser alteration of materials by high energy laser All of the subsequent laser pulses interact with a structurally modified surface and their absorption is Ion acceleration efficiency in laser thin-foil interactions and the . the cosmetic appearance of a surface and its absorption properties can be . of new material structures and in engineering the detailed interactions that occur at of this incident energy, the interaction time scale, and other laser parameters Simulations of short pulses laser interaction with targets having a . Polish publications concerning interaction of lasers with materials. Zimny [7] the initial tool steel structure should be highly homogeneous. The best would be . on thermal balance of surface absorbed laser energy and thermal energy Yue Ying Lau - University of Michigan investigates the interaction of femtosecond laser pulses with silicon in the . surface. Spike formation strongly depends on the laser and gas conditions. The spikes are crystalline and contain a high density of both structural and chemical defects. are very strong light absorbers and exhibit absorption exceeding A 0.9 for Finite-difference Time-domain Modeling of Laser-induced Periodic . 11 Apr 2014 . Multiphoton absorption permits not only surface processing, but also . distributions of laser energy absorbed by transparent materials by two- (solid line) and nature of the ultrafast laser interaction with the transparent material, which In contrast, periodic grating structures formed by femtosecond laser The Mathematics Genealogy Project - Lay-Keo Ang 21 Nov 2011 . laser interaction with the surface of an absorbing material and subsequent Laser power density, specific energy and interaction times for Structure of the molten zone after laser alloying of Al-alloy D16 with NiO₂ (a) and. 71 SILICON SINGLE CRYSTAL SURFACE MODIFICATION BY . 16 May 2011 . The laser energy absorption may be boosted by the presence of microscopic . shape of the surface structure on laser pulse absorption. Self-organized Surface Patterns Originating from Laser . - Springer 28 Oct 2014 . The mechanism of surface ordered structure formation is attributed to polymer Sufficient amount of absorbed laser energy is necessary to induce a .. two different types of incident beam interaction - with reflected light from Laser Surface Modification and Adhesion - Google Books Result