

## **Effect of inclination angle on the absorptance of a graphite-coated cold-rolled steel sheet irradiated by laser**

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### **Abstract**

This work presents an experimental-numerical methodology aimed at deriving the relation between absorptance and incident angle of a randomly polarized Yb fiber-laser beam applied to a graphite-coated stainless steel cold-rolled sheet. The absorptance values were obtained by minimizing the error between temperature evolution measurements at various locations of the irradiated sheet and the corresponding finite element predictions. The absorptance was found to increase from 0.66 to 0.71 in the region between  $0^\circ$  and  $10^\circ$ , to return to the original value between  $10^\circ$  and  $20^\circ$ , to remain relatively constant between  $20^\circ$  and  $50^\circ$ , and then to drop sharply between  $50^\circ$  and  $80^\circ$  finishing at 0.44. Furthermore, the consequences of these results in the laser bending process are analyzed..