

THEORY OF PLASMA DYNAMICS IN THE CASE
OF SOLID MATTER SURFACE DESTRUCTION
BY PULSES OF POWER RADIATION

*L.V. Shmeleva, S.M. Yezhov, A.D. Suprun,
S.Ya. Shevchenko*

Taras Shevchenko Kyiv National University,
Faculty of Physics
(2, Academician Glushkov Prosp., Kyiv 03127, Ukraine;
e-mail: lshmel@univ.ua)

S u m m a r y

We present a theoretical interpretation of the destructive effect of a powerful pulse of radiation on a substance surface. We study the specific features of both the dynamics of the surface destruction of a material and the spatio-temporal dynamics of a gas phase. This phase arises due to local phase transitions under the rapid heating of the surface by a laser pulse, which induces the formation (the burn-out) of a corrosion crater. The differential equation which describes the burning dynamics of a plasma torch is formulated. The general solution of the equations of the dynamics of a plasma-gaseous phase is obtained, and its “behavior” is analyzed for different levels of the interaction of radiation with gas.