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ON TIME MAP FORMULAE

ARMANDS GRITSANS, FELIX SADYRBAEV

Daugavpils University

Parades 1, LV-5400, Daugavpils, Latvia

E-mail: arminge@inbox.lv, felix@latnet.lv

Let us consider a function $U(\alpha, \lambda)$ which has the following meaning: for given $\alpha > 0$ and $\lambda > 0$ $U(\alpha, \lambda)$ is the distance from $t = a$ to the first (after a) zero of a solution to the initial value problem

$$x'' + \lambda f(x) = 0, \quad x(a) = 0,\ x'(a) = \alpha, \tag{1}$$

in other words, the function $U(\alpha, \lambda)$ is the first zero function (time map) for a solution of the problem (1). We study the function U as a function of two arguments, looking for expressions of the first and second order partial derivatives and obtaining the consequences of them.

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