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## ON OSCILLATION OF N<sup>TH</sup> ORDER ODE

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We consider positively homogeneous the  $N^{th}$  order differential equations of the type

$$x^{(n)} = h(t, x) \tag{1}$$

where h possesses the property that h(t, cx) = ch(t, x) for  $c \ge 0$ . This class includes the linear equations  $x^{(n)} = p(t)x$  and piece-wise linear ones  $x^{(n)} = k_2x^+ - k_1x^-$ . We use the definition.

DEFINITION 1. [I.T. Kiguradze, T.A. Chanturia, [2]]

Let us call equation (1) like [l, n-l] - oscillatory equation in interval I, if there exist  $t_1, t_2 \in I$ ,  $t_1 < t_2$ , and nontrivial solution of (1) such that

$$x^{(i)}(t_1) = 0, \quad i = 0, \dots, l-1,$$
  
 $x^{(i)}(t_2) = 0, \quad i = 0, \dots, n-l-1.$ 

We describe the oscillatory behavior of positively homogeneous equations in terms of (N - 2, 2)-oscillation in  $[a, +\infty)$ .

Properties of (N-2, 2)-solutions of positively homogeneous equations are useful for investigations of some nonlinear boundary value problems.

## REFERENCES

- F. Sadyrbaev. Multiplicity of solutions for fourth order nonlinear boundary value problems. Proc. Latvian Acad. Sciences, 7/8 (576/577), 1995, 107 – 111.
- [2] I.T. Kiguradze, T.A. Chanturia. Asymptotic properties of solutions of nonautonomous ordinary differential equations. "Nauka", Moscow, 1990. (in Russian)
- [3] T.Garbuza. Results for sixth order positively homogeneous equations. Mathematical Modelling and Analysis, 14 (1), 2009, 25–32.