1093-39-151 **Anatoli F Ivanov*** (afi1@psu.edu), Department of Mathematics, Pennsylvania State University, P.O.Box PSU, Lehman, PA 18627, and **Sergei I Trofimchuk** (trofimch@inst-mat.utalca.cl), Institute of Mathematics and Physics, University of Talca, Casilla 747, Talca. *Periodic Solutions and Global Dynamics in a Periodic Differential Delay Equation.*

Several aspects of global dynamics and the existence of periodic solutions are studied for the scalar differential delay equation

$$x'(t) = a(t)f(x([t - K])),$$

where

(i) $f(x)$ is a continuous function satisfying the negative feedback condition

$$x \cdot f(x) < 0 \quad \text{for all} \quad x \neq 0$$

(ii) $0 < a(t)$ is a continuous periodic function with period $\omega > 0$

(iii) $[\cdot]$ is the integer part function, and the integer $K \geq 0$ is the delay.

The case of integer period ω allows for a reduction to finite-dimensional difference equations. The dynamics of the latter are studied in terms of corresponding discrete maps, including the partial case of interval maps ($K = 0$). Sufficient conditions for the existence of periodic solutions are derived and their stability is studied. Complex behavior of solutions is demonstrated in terms of the well known criteria for interval maps. (Received August 10, 2013)