

# Emden-Fowler type difference equations of the fourth-order

JANA KREJČOVÁ

*Department of Mathematics and Statistics,  
Masaryk University,  
Brno,  
Czech Republic*

*E-mail address: krejcovajana@mail.muni.cz*

This is a joint work with Prof. Zuzana Došlá. We consider the nonlinear difference equation

$$\Delta \left( a_n \left( \Delta b_n (\Delta c_n (\Delta x_n)^\gamma)^\beta \right)^\alpha \right) + d_n x_{n+\tau}^\lambda = 0,$$

where  $\alpha, \beta, \gamma, \lambda$  are the ratios of odd positive integers,  $\tau \in \mathbb{Z}$  and  $\{a_n\}, \{b_n\}, \{c_n\}, \{d_n\}$  are positive real sequences defined for all  $n \in \mathbb{N}$ .

We state new oscillation theorems and we complete the existing results in the literature. Our approach is based on considering our equation as a system of the four-dimensional difference system and on the cyclic permutation of the coefficients in the difference equations.