1133-35-287 **Tariel Kiguradze** (tkigurad@fit.edu) and **Noha Al-Jaber*** (naljaber2013@my.fit.edu), Florida Institute of Technology, 150 W. University Blvd, Melbourne, FL 32901. *Unique Solvability of Ill-posed Periodic Problem for a Higher Order Linear Hyperbolic Equation.*

Abstract. Consider the periodic problem

$$u^{(\mathbf{m})} = p(\mathbf{x})u + q(\mathbf{x}), \qquad (1)$$

$$u(\mathbf{x} + \mathbf{T}_i) = u(\mathbf{x}) \quad (i = 1, \dots, n), \quad (2)$$

where $n \geq 2, \mathbf{x} = (x_1, \dots, x_n), \mathbf{T} = (T_1, \dots, T_n), \mathbf{T}_i = (0, \dots, T_i, \dots, 0), \mathbf{m} = (m_1, \dots, m_n), \|\mathbf{m}\| = m_1 + \ldots + m_n$. If $\mathbf{l} = (l_1, \dots, l_n) \in \mathbb{Z}_+^n$, then by $C_{\mathbf{T}}^{\mathbf{l}}(\mathbb{R}^n)$ denote the space of continuous functions $u : \mathbb{R}^n \to \mathbb{R}$ satisfying (2) and having continuous partial derivatives $u^{(\mathbf{k})}$, $(\mathbf{k} \leq \mathbf{l})$.

Theorem. *Let* $\mathbf{m} = 2\mathbf{m}^*$,

$$(-1)^{\|\mathbf{m}^*\|} p(\mathbf{x}) \leq 0,$$

$$(-1)^{\|\mathbf{m}^*\|} \int_0^{T_j} p(x_1, \dots, s_j, \dots, x_n) ds_j < 0 \quad (j = 1, \dots, n),$$

and let $p, q \in C_{\mathbf{T}}^{\mathbf{l}}(\mathbb{R}^n)$. *Then problem* $(1), (2)$ *has a unique (weak, if* $\mathbf{l} \prec \mathbf{m}$*) solution* $u \in C_{\mathbf{T}}^{\mathbf{l}}(\mathbb{R}^n)$. (Received July 31, 2017)