1070-30-256 **André Boivin*** (`boivin@uwo.ca`) and **Changzhong Zhu** (`czhu28@uwo.ca`), Department of Mathematics, University of Western Ontario, Canada. *A Bi-orthogonal Expansion in the Space* $L^2(0,\infty)$. Preliminary report.

Assume that a sequence of complex numbers $\{\lambda_k\}$ $(k=1,2,\ldots)$ satisfies the conditions: $\Re(\lambda_k)>0$, $\lambda_k\neq\lambda_j$ for $k\neq j$ and $\sum_{k=1}^{\infty}\frac{\Re(\lambda_k)}{1+|\lambda_k|^2}<+\infty$. It is known that under the above conditions, the Blaschke product $W(\xi)=\prod_{k=1}^{\infty}\left[\frac{\xi-\lambda_k}{\xi+\overline{\lambda}_k}\cdot\frac{|1-\lambda_k^2|}{1-\lambda_k^2}\right]$ converges to an analytic function $W(\xi)$ in the right half-plane $\Re(\xi)>0$, and that the exponential system

$$\{e^{-\lambda_k x}\} \quad (k=1,2,\ldots) \tag{1}$$

is incomplete in $L^2(0,\infty)$. V. Kh. Musoyan (1986) also showed that if

$$\psi_k(x)=-\frac{1}{\overline{W'(\lambda_k)}}\cdot\frac{1}{2\pi}\int_{-\infty}^{+\infty}\frac{e^{-i\tau x}}{W(i\tau)(i\tau+\overline{\lambda}_k)}d\tau \qquad (k=1,2,\ldots), \tag{2}$$

then the systems (1) and (2) are bi-orthogonal in $L^2(0,+\infty)$. Using the Fourier transform and corresponding results in the Hardy space H_+^2 for the upper half-plane, the bi-orthogonal expansions with respect to the systems (1) and (2) will be obtained. (Received February 14, 2011)