1094-42-66 **Alexander (Oleksandr) V Tovstolis*** (atovstolis@math.okstate.edu), Department of Mathematics, Oklahoma State University, 401 Mathematical Sciences, Stillwater, OK 74078. *Norm estimates for the Hadamard product operator on Hardy and Bergman spaces.*

The **Hadamard Convolution**, or **Hadamard Product**, of two harmonic functions f and g in the unit disk $\mathbb{D}$ of the complex plane

$$f\left(re^{i\theta}\right) = \sum_{n=-\infty}^{\infty} a_n r^{|n|} e^{in\theta}, \quad g\left(re^{i\theta}\right) = \sum_{n=-\infty}^{\infty} b_n r^{|n|} e^{in\theta}, \quad r \in [0,1),\ \theta \in \mathbb{R},$$

is defined by

$$(f * g)\left(re^{i\theta}\right) = \sum_{n=-\infty}^{\infty} a_n b_n r^{|n|} e^{in\theta}, \quad r \in [0,1),\ \theta \in \mathbb{R}.$$

If we fix f, we obtain a linear operator

$$f*: \sum_{n=-\infty}^{\infty} b_n r^{|n|} e^{in\theta} \mapsto \sum_{n=-\infty}^{\infty} a_n b_n r^{|n|} e^{in\theta}.$$

For $1 \le p \le q \le \infty$, we investigated the operator $f*$ acting on harmonic (h^p) or holomorphic (H^p) spaces onto h^q or H^q, respectively. For the holomorphic case, estimates for the norm of $f*$ are obtained with $p, q \in (0, \infty]$.

Furthermore, we consider the Hadamard product operator acting on Bergman spaces of harmonic (a^p onto a^p) or holomorphic (A^p onto A^p) functions for $p \in [1, \infty)$, as well as on Hardy spaces (h^p or H^p) onto Bergman spaces a^q or A^q, respectively.

In several cases, the obtained estimates are sharp. (Received August 08, 2013)