Meeting: 1004, Bowling Green, Kentucky, SS 7A, Special Session on Semigroups of Operators and Applications

1004-47-162 **Elena T. Toneva*** (etoneva@mail.ewu.edu), EWU, Department of Mathematics, Cheney, WA 99004. *Cocycles of Holomorphic Flows.*

Let Ω be a domain (open, connected and non-empty) in the complex plane $\mathbf{C}$ and let $H(\Omega)$ be the set of holomorphic functions on Ω. A continuous one-parameter family $\varphi(t,z) : [0,\infty) \times \Omega \to \Omega$ of nonconstant holomorphic functions satisfying $\varphi(0,z) = z$ and $\varphi(s+t,z) = \varphi(s,\varphi(t,z))$ for all $s,\ t \geq 0$ and $z \in \Omega$ is called a *holomorphic flow.* A continuous complex-valued function m on $[0,\infty) \times \Omega$ is said to be a *multiplicative cocycle* for the flow φ if m satisfies the following conditions: (i) $m(t,\cdot) \in H(\Omega) \quad hbox for all t \geq 0$,

(ii) $m(0,z) = 1 \quad$ for all $z \in \Omega$,

(iii) $m(t+s,z) = m(s,z)\, m(t,\varphi(s,z)) \quad$ for all $t,s \geq 0, z \in \Omega$.

We prove that cocycles are differentiable with respect to the flow parameter, and their derivatives are holomorphic functions. Cocycles appear in the study of semigroups of composition operators. (Received January 24, 2005)