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Nadya Askaripour* (askarina@ucmail.uc.edu), Department of Mathematical sciences, French Hall West, 2815 Commons Way, University of Cincinnati, Cincinnati, OH 45221. *Poincare series map and k-differentials on Riemann surfaces.*

A k -differential on a Riemann surface R is a section of the cotangent bundle on R tensored k -times by itself. A k -differential can be seen as automorphic form of weight k also. Quadratic differentials (case $k=2$) are special, because of their relation to Teichmüller theory. Poincaré series is a classic technique to construct k -differentials. It is linear, bounded and surjective operator. Poincaré series have some applications in studying of k -differentials on Riemann surfaces. In this talk I will review some facts about k -differentials and Poincaré series map, and also I will present some new results about them. (Received September 09, 2013)