1052-30-198 **Yolanda Fuertes**, **Gabino Gonzalez-Diez*** (gabino.gonzalez@uam.es), **Ruben A Hidalgo** and **Maximiliano Leyton**. *The full automorphism group of a family of generalized Fermat curves.* Preliminary report.

Describing the automorphism group of a Riemann surface S is in general a difficult problem. A case in which this group $Aut(S)$ can be understood is when one knows that there is a subgroup $H < Aut(S)$ such that

(1) H is unique, hence normal, in $Aut(S)$ so that there is an obvious homomorphism $Aut(S) \rightarrow Aut(S/H)$, where $Aut(S/H)$ stands for the group of automorphisms of S/H (as an orbifold).

(2) All elements of $Aut(S/H)$ lift to elements of $Aut(S)$ so that the sequence $1 \rightarrow H \rightarrow Aut(S) \rightarrow Aut(S/H) \rightarrow 1$ is exact.

(3) The quotient S/H is an orbifold of genus 0 with r branch values so that $Aut(S/H)$ is a subgroup of Möbius transformations preserving r points, hence isomorphic to a subgroup of the symmetric group S_r.

It then follows that $Aut(S)$ is an extension of H by a subgroup of S_r, the classical case being the hyperelliptic one.

Here we study a family of generalized Fermat curves in which the role of H is played by $\mathbb{Z}_k^n$ and S/H has genus 0 and $n+1$ branching values, all of order k. We show that when $k, n > 2$ all these curves satisfy (2) and (3) and that when $n = 3$ they also satisfy (1) and so $Aut(S)$ is an extension of H by a subgroup of S_4. (Received August 28, 2009)