

Handel, Michael; Thurston, William P.

New proofs of some results of Nielsen. (English) Zbl 0584.57007
Adv. Math. 56, 173-191 (1985).

The paper contains an excellently written short proof of results (close to those) of J. Nielsen on the types of homeomorphisms of surfaces. The authors prove the following theorem which is in this form due to *R. T. Miller* [ibid. 45, 189-212 (1982; [Zbl 0496.57003](#))]. Theorem. Let $\tau : M^2 \rightarrow M^2$ be a homeomorphism of a compact orientable surface with negative Euler characteristic. Then τ is isotopic to a homeomorphism ϕ with one of the following properties: i) ϕ^n is isotopic to the identity; ii) ϕ preserves a pair of transversal geodesic laminations (a configuration close to a foliation) which intersect every closed geodesic in M and have leaves only being dense in the lamination; iii) there is a finite collection γ of simple closed curves such that ϕ permutes the components of an open regular neighbourhood of γ . The powers of ϕ preserving some component of the complement of the regular neighbourhood define there a mapping of type i) or ii). The mappings of type ii) are similar to the so-called pseudo-Anosov homeomorphisms.

Reviewer: [H.Zieschang](#)

MSC:

57N05 Topology of the Euclidean 2-space, 2-manifolds (MSC2010)
[57R50](#) Differential topological aspects of diffeomorphisms
[37-XX](#) Dynamical systems and ergodic theory

Cited in **1** Review
Cited in **35** Documents

Keywords:

[homeomorphisms of surfaces](#); [geodesic laminations](#); [simple closed curves](#); [pseudo-Anosov homeomorphisms](#)

Full Text: [DOI](#)

References:

- [1] Brown, R.F, The Lefschetz fixed point theorem, (1971), Scott, Foresman Glenville, Ill · [Zbl 0216.19601](#)
- [2] Bundgaard, S; Nielsen, J, Forenklede beviser for nogle saetninger i fladetopologien, *Mat. tadsskrift B*, 1-16, (1946)
- [3] Miller, R.T, Nielsen's viewpoint on geodesic laminations, *Adv. in math.*, 45, 189-212, (1982) · [Zbl 0496.57003](#)
- [4] Nielsen, J, Untersuchung zur topologie der geschlossenen zweiseitigen flachen, *Acta math.*, 50, (1927) · [Zbl 53.0545.12](#)
- [5] Nielsen, J, Paper II, *Acta math.*, 53, (1929)
- [6] Nielsen, J, Paper III, *Acta math.*, 58, (1931)
- [7] Nielsen, J, Surface transofrmation classes of algebraically finite type, *K. dan. vidensk. selsk. mat.-fys. medd.*, 21, No. 2, (1944)
- [8] {scW. P. Thurston}, On the geometry and dynamics of diffeomorphisms of surface I, preprint.
- [9] {scW. P. Thurston}, The geometry and topology of 3-manifolds, preprint.
- [10] Zieschang, H, Finite groups of mapping classes of surfaces, () · [Zbl 0472.57006](#)
- [11] Fathi, A; Laudenbach, F; Poenaru, V, Travaux de Thurston sur LES surfaces, *Asterisque*, 66-67, (1979)

This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.