

## Lectures on topology of words

**Vladimir Turaev**

Received: 2 September 2006 / Revised: 23 November 2006 / Accepted: 30 November 2006

Published online: 28 March 2007

© The Mathematical Society of Japan and Springer 2007

Communicated by: Toshiyuki Kobayashi

*Based on notes by Eri Hatakenaka, Daniel Moskovich, and Tadayuki Watanabe*

**Abstract.** We discuss a topological approach to words introduced by the author in [Tu2]–[Tu4]. Words on an arbitrary alphabet are approximated by Gauss words and then studied up to natural modifications inspired by the Reidemeister moves on knot diagrams. This leads us to a notion of homotopy for words. We introduce several homotopy invariants of words and give a homotopy classification of words of length five.

*Keywords and phrases:* words, curves, homotopy

*Mathematics Subject Classification (2000):* 57M99, 68R15

---

---

V. TURAEV

IRMA, Université Louis Pasteur - C.N.R.S., 7 rue René Descartes, F-67084 Strasbourg, France  
(e-mail: turaev@math.u-strasbg.fr)