

Geometric Group Theory/Théorie géométrique des groupes

3–14 *july*/juillet, 2006

• MINI-COURS •

Group actions on CAT(0) cube complexes

Graham A. Niblo

`g.a.niblo@soton.ac.uk`

School of Mathematics

University of Southampton

Highfield Hampshire

Southampton, SO17 1BJ

UNITED KINGDOM

and

Michah Sageev

`sageevm@techunix.technion.ac.il`

Department of Mathematics

Technion - Israel Institute of Technology

Haifa 32000

ISRAEL

Abstract

CAT(0) cube complexes arise naturally in low dimensional topology and geometry. We will study there global geometric and combinatorial structure and show how to use it to derive information about groups acting on them. In particular we will examine the Haagerup property and property (T) , and look at the normal cube paths which form a natural combinatorial approximation to the geodesics in such a space. We will examine some examples in depth, including the cube complexes associated to Coxeter groups and Wise's construction of cube complexes associated to small cancellation 2-complexes. We will also study Sageev's generalisation of Bass–Serre theory for essential group actions on CAT(0) cube complexes and the role this plays in group splitting theory.