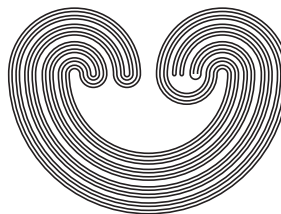


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## RIGHT-ANGLED MOCK REFLECTION SURFACES

by

RICHARD SCOTT AND TIMOTHY SCHROEDER

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## RIGHT-ANGLED MOCK REFLECTION SURFACES

RICHARD SCOTT AND TIMOTHY SCHROEDER

**ABSTRACT.** In articles by M. Davis, T. Januskiewicz, and R. Scott (see *Nonpositive curvature of blow-ups*, *Selecta Math.* (N.S.) **4** (1998), no. 4, 491–547 and *Fundamental groups of blow-ups*, *Adv. Math.* **177** (2003), no. 1, 115–179) and another article by Richard Scott (see *Right-angled mock reflection and mock Artin groups*, *Trans. Amer. Math. Soc.* **360** (2008), no. 8, 4189–4210), a generalization of right-angled Coxeter groups, so-called right-angled mock reflection groups (RAMRGs), are introduced and explored. As is the case with Coxeter groups, these groups can be defined by a finite simple graph (one that is now “decorated” in the language of Colin Hagemeyer and Richard Scott in *On groups with Cayley graph isomorphic to a cube* [*Comm. Algebra* **42** (2014), no. 4, 1484–1495]), and they act on CAT(0) cubical complexes such that the stabilizer of every edge is  $\mathbb{Z}_2$  and the 1-skeleton of the link of every vertex is isomorphic to the defining graph. This note examines the case where the defining graph  $\Gamma$  is homeomorphic to  $\mathbb{S}^1$ , and thus the corresponding cubical complex  $\Sigma$  is a 2-manifold. We show, explicitly, that these RAMRGs are virtually torsion-free and we describe the resulting quotient surfaces.

### 1. INTRODUCTION

Let  $\Gamma$  be a finite, simple graph with vertex set  $S$ .  $\Gamma$  encodes the data for a presentation of a *right-angled Coxeter group* (RACG)  $W_\Gamma$ :

$$W_\Gamma = \langle S \mid s^2 = 1 \text{ for each } s \in S \text{ and } (st)^2 = 1 \text{ for each edge } \{s, t\} \text{ of } \Gamma \rangle.$$

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