

**Kasparian, Azniv; Kotzev, Boris****Weak form of Holzapfel's conjecture.** (English) Zbl 1210.14027

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Summary: Let  $\mathbb{B} \subset \mathbb{C}^2$  be the unit ball and  $\Gamma$  be a lattice of  $SU(2, 1)$ . Bearing in mind that all compact Riemann surfaces are discrete quotients of the unit disc  $\Delta \subset \mathbb{C}$ , Holzapfel conjectures that the discrete ball quotients  $\mathbb{B}/\Gamma$  and their compactifications are widely spread among the smooth projective surfaces. There are known ball quotients  $\mathbb{B}/\Gamma$  of general type, as well as rational, abelian, K3 and elliptic ones. The present note constructs three non-compact ball quotients, which are birational, respectively, to a hyperelliptic, Enriques or a ruled surface with an elliptic base. As a result, we establish that the ball quotient surfaces have representatives in any of the eight Enriques classification classes of smooth projective surfaces.

**MSC:**

- [14G35](#) Modular and Shimura varieties
- [11G18](#) Arithmetic aspects of modular and Shimura varieties
- [11F23](#) Relations with algebraic geometry and topology
- [30F40](#) Kleinian groups (aspects of compact Riemann surfaces and uniformization)

Cited in 1 Review