

Erratum to: There Is No Face-to-Face Partition of R^5 into Acute Simplices

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Theorem 5.1 *There is no acute partition of R^5 into 5-simplices.*

The proof of Theorem 5.1 was incorrect in the original version. The end of the proof after formula (5.3) should be modified as follows.

Denote by $\alpha_1^F, \dots, \alpha_{10}^F$ all dihedral angles of a given 4-simplex F . Then from [8] we have

$$4\pi < \sum_{i=1}^{10} \alpha_i^F.$$

Moreover, the sum of all dihedral angles $\alpha_1^T, \dots, \alpha_{n_T}^T$ of 4-simplices around a given triangle T from ∂P is less than 2π (see Lemma 3.3). Therefore,

$$4\pi f < \sum_F \sum_{i=1}^{10} \alpha_i^F = \sum_T \sum_{j=1}^{n_T} \alpha_j^T < 2\pi t,$$

where the sums \sum_F and \sum_T are taken over all 4-simplices F and triangles T from ∂P , respectively. Consequently,

$$2f < t. \tag{5.4}$$

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Gathering (5.3), (5.2), and (5.4), we find that

$$5t \leq 4c = 10f < 5t,$$

which is a contradiction. \square

Kalai's much earlier paper [9] already contained a combinatorial version of the result. Another proof of Theorem 5.1 appeared recently also in [10].

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References

8. Gaddum, J.W.: Distance sums on a sphere and angle sums in a simplex. *Am. Math. Mon.* **63**, 91–96 (1956)
9. Kalai, G.: On low-dimensional faces that high-dimensional polytopes must have. *Combinatorica* **10**, 271–280 (1990)
10. Koczyński, E., Pak, I., Przytycki, P.: Acute triangulations of polyhedra and R^n . [arXiv:0909.3706](https://arxiv.org/abs/0909.3706) (2009)