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Commutative Algebra

New submissions

Submissions received from Mon 3 Aug 20 to Tue 4 Aug 20, announced Wed, 5 Aug 20

- [New submissions](#)
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New submissions for Wed, 5 Aug 20

[1] [arXiv:2008.01428](#) [[pdf](#), [ps](#), [other](#)]
Title: Canonical trace ideal and residue for numerical semigroup rings
Authors: [Jürgen Herzog](#), [Takayuki Hibi](#), [Dumitru I. Stamate](#)
Comments: 16 pages; this paper contains most of the results related to numerical semigroups from the initial version of our paper [arXiv:1612.02723](#) [math.AC]
Subjects: Commutative Algebra (math.AC)

For a numerical semigroup ring $K[H]$ we study the trace of its canonical ideal. The colength of this ideal is called the residue of H . This invariant measures how far is H from being symmetric, i.e. $K[H]$ from being a Gorenstein ring. We remark that the canonical trace ideal contains the conductor ideal, and we study bounds for the residue. For \mathbb{N} -generated numerical semigroups we give explicit formulas for the canonical trace ideal and the residue of H . Thus, in this setting we can classify those whose residue is at most one (the nearly-Gorenstein ones), and we show the eventual periodic behaviour of the residue in a shifted family.

[2] [arXiv:2008.01717](#) [[pdf](#), [ps](#), [other](#)]
Title: Diagonal degenerations of matrix Schubert varieties
Authors: [Patricia Klein](#)
Comments: Comments welcome!
Subjects: Commutative Algebra (math.AC); Algebraic Geometry (math.AG); Combinatorics (math.CO)

Knutson and Miller (2005) established a connection between the anti-diagonal Gröbner degenerations of matrix Schubert varieties and the pre-existing combinatorics of pipe dreams. They used this correspondence to give a geometrically-natural explanation for the appearance of the combinatorially defined Schubert polynomials as representatives of Schubert classes. Recently, Hamaker, Pechenik, and Weigandt proposed a similar connection between diagonal degenerations of matrix Schubert varieties and bumpless pipe dreams, newer combinatorial objects introduced

by Lam, Lee, and Shimozono. Hamaker, Pechenik, and Weigandt described new generating sets of the defining ideals of matrix Schubert varieties and conjectured a characterization of permutations for which these generating sets are diagonal Gröbner bases. They proved special cases of this conjecture and described diagonal degenerations of matrix Schubert varieties in terms of bumpless pipe dreams in these cases. The purpose of this paper is to prove the general conjecture. The proof uses a connection between liaison and geometric vertex decomposition established in earlier work with Rajchgot.

Replacements for Wed, 5 Aug 20

[3] [arXiv:1612.02723](#) (replaced) [[pdf](#), [ps](#), [other](#)]

Title: The trace of the canonical module

Authors: [Jürgen Herzog](#), [Takayuki Hibi](#), [Dumitru I. Stamate](#)

Comments: v3: minor changes to Sections 3 and 4. Theorem 6.6 is new. The last part in v2 dealing with numerical semigroups is separated into another paper; v2: changes in Sections 3 and 6. We updated the bibliography to mention previous work by Ding and Huneke-Vraciu. Comments welcome. 25 pages

Journal-ref: Israel Journal of Mathematics, Volume 233, Issue 1 (2019), 133-165

Subjects: Commutative Algebra (math.AC); Combinatorics (math.CO); Rings and Algebras (math.RA)

[4] [arXiv:1912.01073](#) (replaced) [[pdf](#), [ps](#), [other](#)]

Title: Lech's Inequality for the Buchsbaum-Rim Multiplicity and Mixed Multiplicity

Authors: [Vinh Nguyen](#), [Kelsey Walters](#)

Comments: 15 pages, 0 figures; major revisions in this version to enhance readability

Subjects: Commutative Algebra (math.AC)

[5] [arXiv:2007.12209](#) (replaced) [[pdf](#), [ps](#), [other](#)]

Title: Nakayama closures, interior operations, and core-hull duality

Authors: [Neil Epstein](#), [Rebecca R.G.](#), [Janet Vassilev](#)

Comments: 39 pages. Apart from a couple minor corrections in section 3, the main change in this version is that we spruced up the introduction. Comments still very welcome!

Subjects: Commutative Algebra (math.AC)

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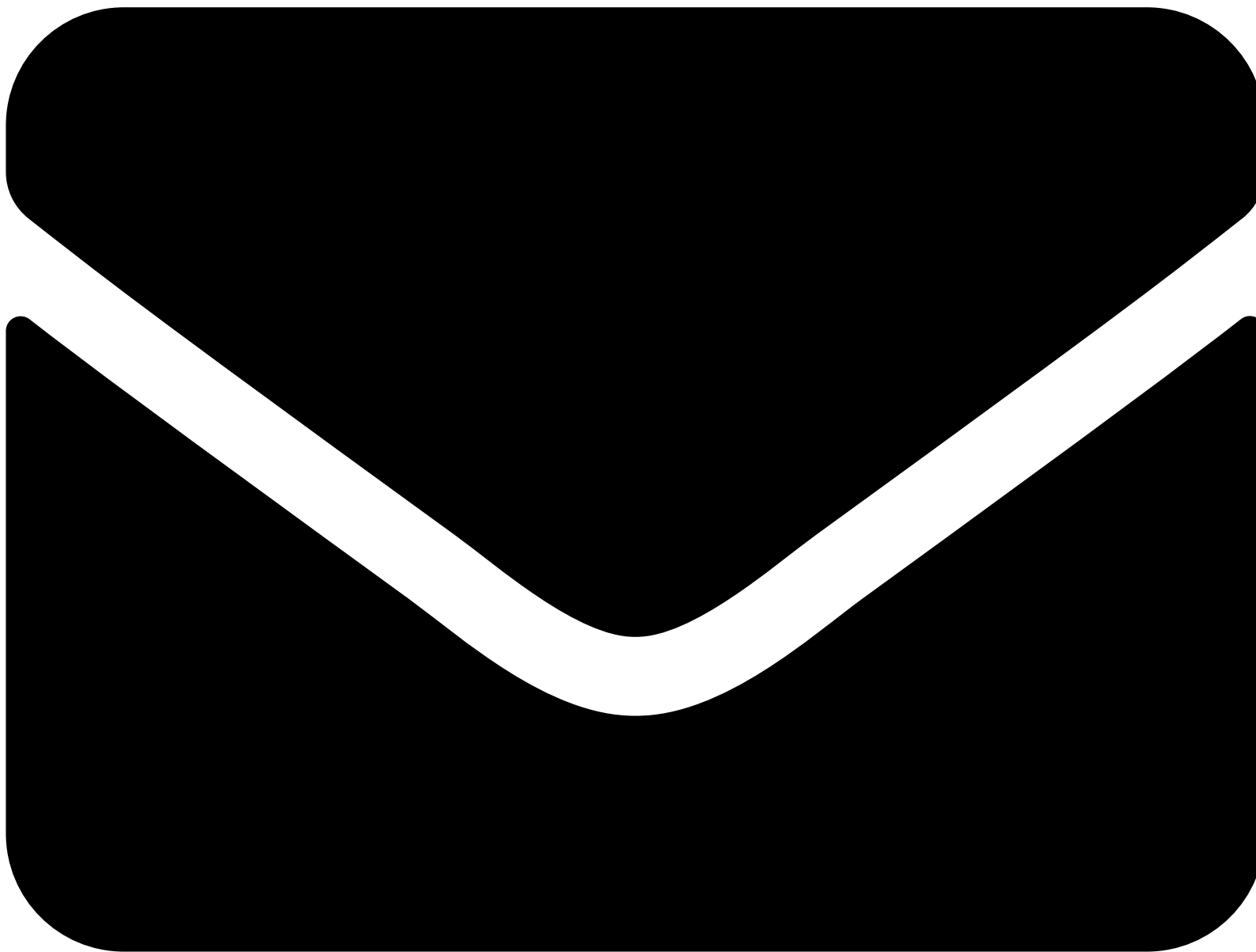
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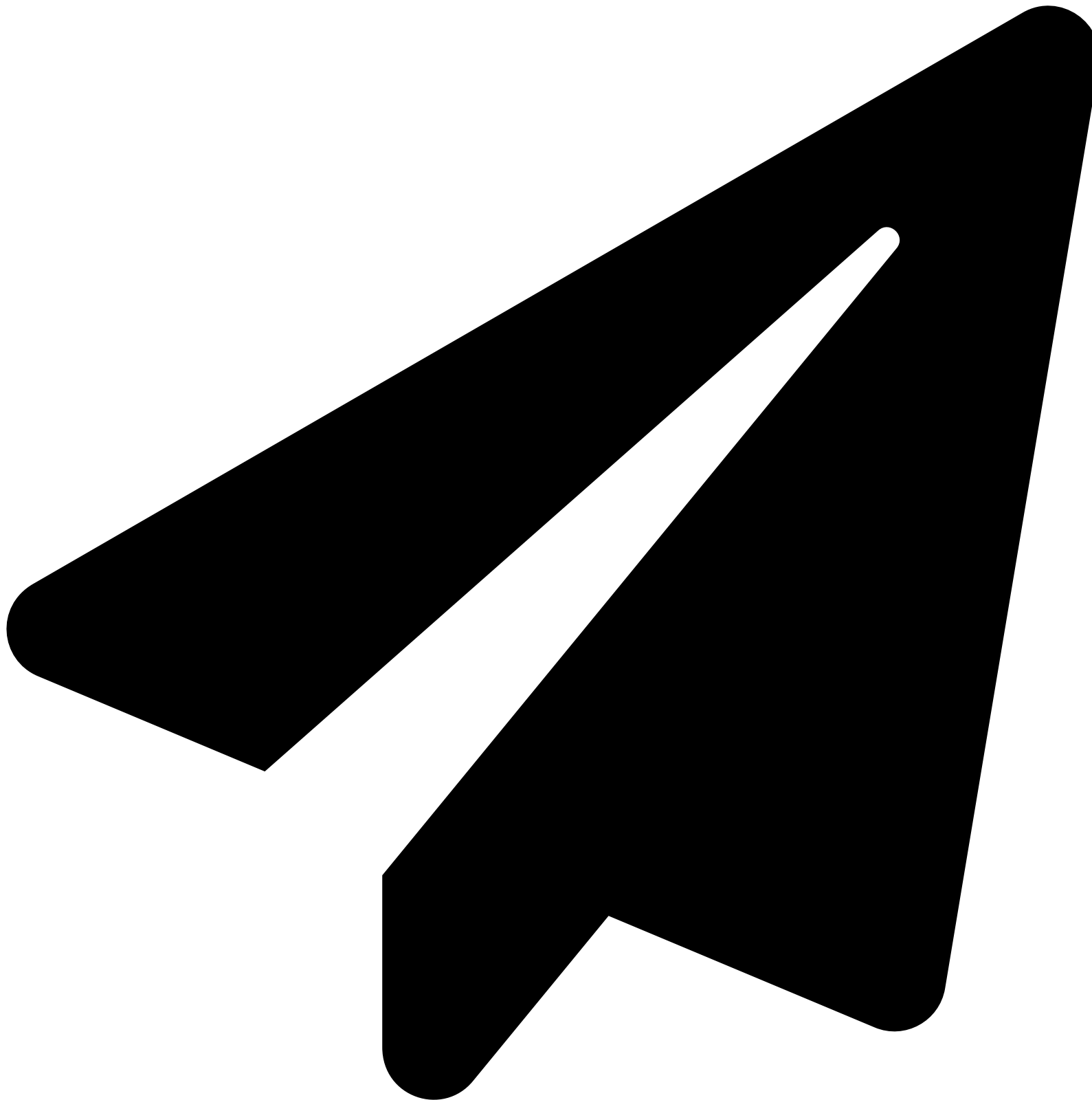
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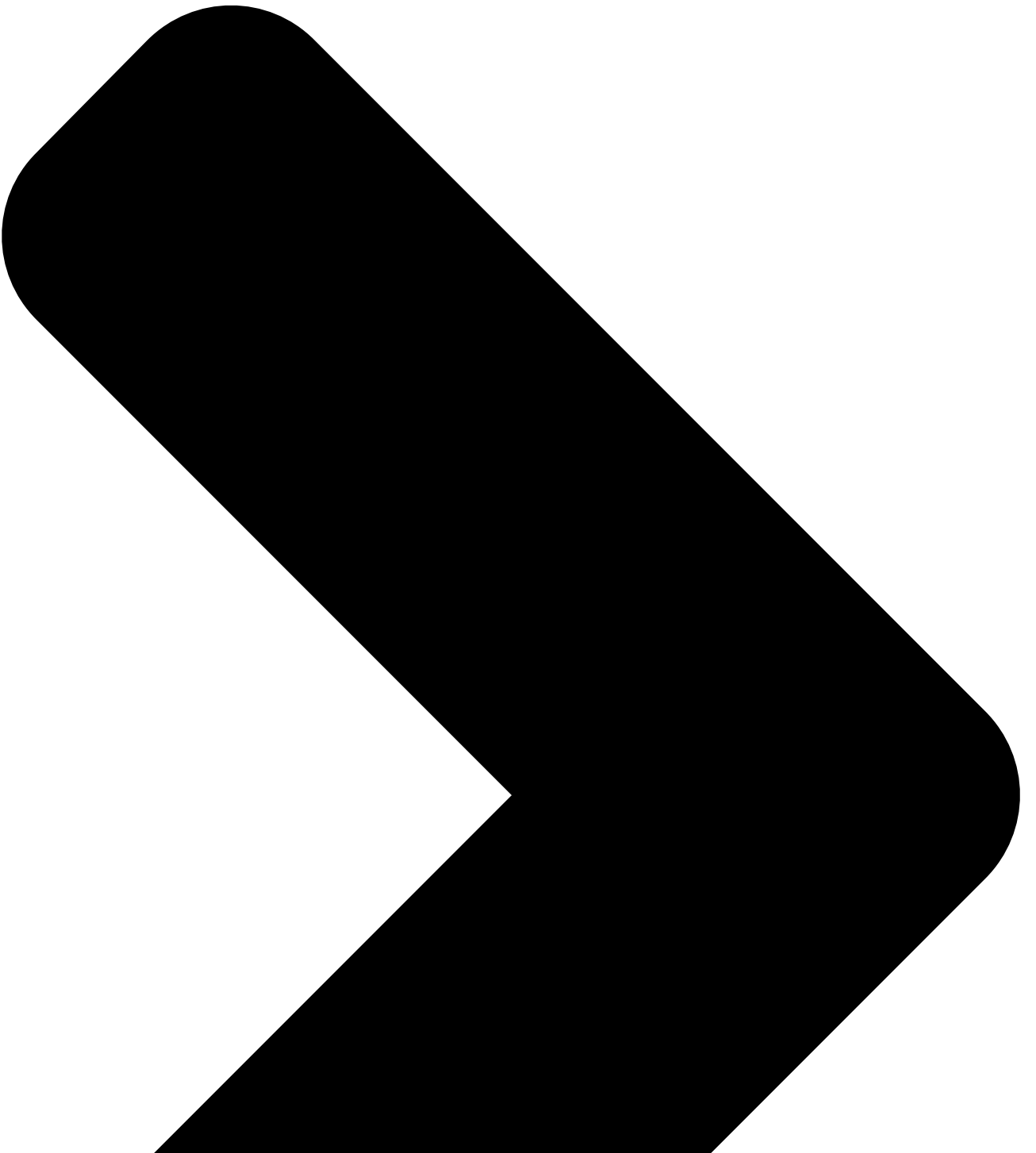
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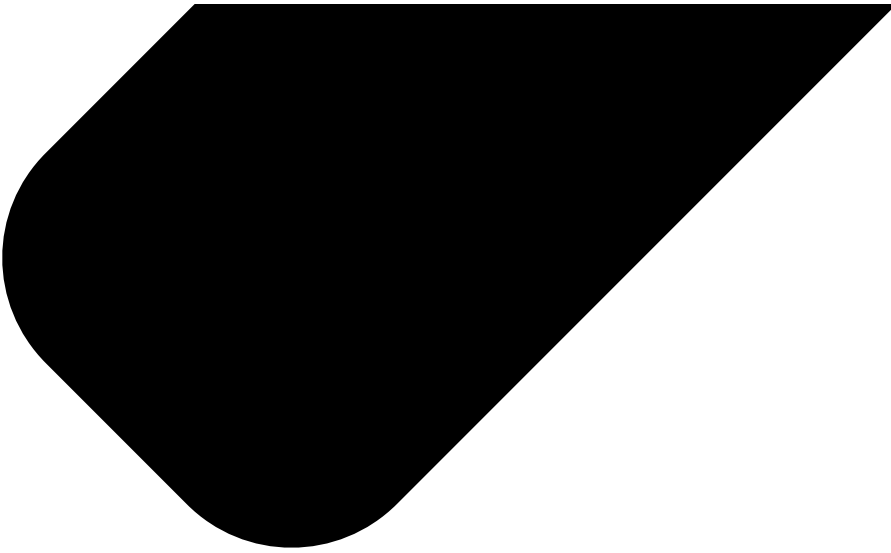
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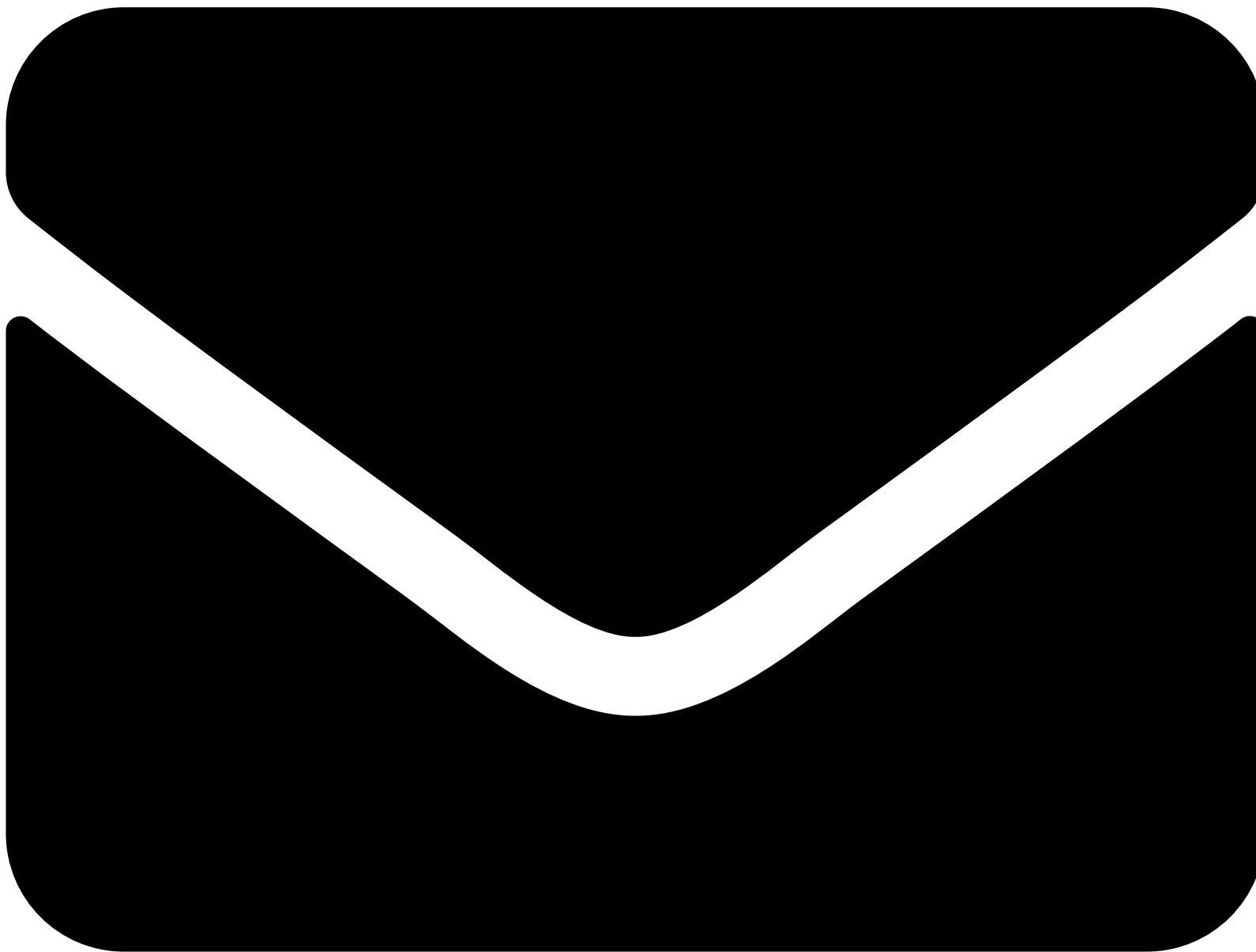
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