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A double copy from twisted (co)homology at genus one

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We study the twisted (co)homology of a family of genus-one integrals —the so called Riemann-Wirtinger integrals. These integrals are closely related to one-loop string amplitudes in chiral splitting where one leaves the loop-momentum, modulus and all but one puncture un-integrated. While not actual one-loop string integrals, they share many properties and are simple enough that the associated twisted (co)homologies have been completely characterized. We use the intersection index —an inner product on the vector space of allowed contours —to derive a double-copy formula for the closed-string analogues of Riemann-Wirtinger integrals (one-dimensional integrals over the torus). These intersection indices form a genus-one KLT-like kernel defining bilinears in meromorphic Riemann-Wirtinger integrals that are equal to their complex counterparts.

Link to publication (if applicable)

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