

## Mathematics &gt; Number Theory

# The complex AGM, periods of elliptic curves over $\mathbb{C}$ and complex elliptic logarithms

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*(Submitted on 3 Nov 2010)*

We present a method for computing period lattices and elliptic logarithms for elliptic curves defined over  $\mathbb{C}$ , using the complex Arithmetic-Geometric Mean (AGM) first studied by Gauss. Earlier authors have only considered the case of elliptic curves defined over the real numbers; here, the multi-valued nature of the complex AGM plays an important role. Our method, which we have implemented in both Magma and Sage, is illustrated with several examples.

Subjects: **Number Theory (math.NT)**Cite as: [arXiv:1011.0914v1](#) [math.NT]

## Submission history

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[v1] Wed, 3 Nov 2010 15:20:48 GMT (30kb)

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