PART 6

THE BEAST

Remember that I said verification is relatively easy?

Return of the Kummer:
a toolbox for genus 2 cryptography

Maria Corte-Real Santos[1] and Krijn Reijnders[2]

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Q: Is it faster than 1D or 2D? **A: No.**

Q: Is it much more difficult? **A: Yes.**

Q: Does it develop general techniques to do 2D isogeny-based cryptography & give a good overview of the use of Kummer surfaces in cryptography?

2D 1D-SQIsign

Map the 2^{1000} isogeny from 1D SQIsign over $\mathbb{F}_{p^2}$ to a 2D isogeny over $\mathbb{F}_p$ using Scholten's construction and Costello's isogenies.

Requires *tons of work* as we now don't do a single "short" 2D-isogeny, but a number of blocks.

So, we developed:

- pairing-based techniques
- efficient basis sampling
- point compression
- curve normalisation

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