Deblending and why it is Impossible

Robert Lupton

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Deblending: the problem
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Stars

The problem of deblending stars is well defined; the image is made up of a set of \( \delta \)-functions convolved with a known PSF, \( \phi \):

\[
I = S + \sum_{r} F_r (x, y) \phi + n
\]

(\(I\): observed intensity; \(S\): sky level; \(F_r\): flux in \(r\)th star; \(\phi\): PSF; \(n\): noise)

All that we have to do is solve a minimisation problem in \(3r + 1\) unknowns.

Writing efficient, robust, accurate code may not be trivial.
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A 1-D Toy Problem, a `star' and two `galaxies'.

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Models

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The problem is that there were many peaks detected within the galaxy.

Solutions:
- Remove non-significant peaks
- Remove "too-similar" templates
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The End
A Proposed Workaround

Measure PSF-matched aperture magnitudes (proposal: 1.1" to match PFS fibres) for:

- The child
- The parent at the position of the child
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