Vector-like Spectra in F-theory 2

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With M.Bies, M.Cvetič, R.Donagi, M.Ong – ongoing project

Set up background geometries

- One quadrillion threefold bases in F-theory compactifications classfied by $\overline{K}_{B_3}^3$ value.

  [Cvetič Halverson Lin Liu Tian '19]

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- Find line bundles to realize MSSM vector-like spectra:

Q_i	$\bar{u}_i$	$\bar{d}_i$	L_i	$\bar{e}_i$	H_u, H_d
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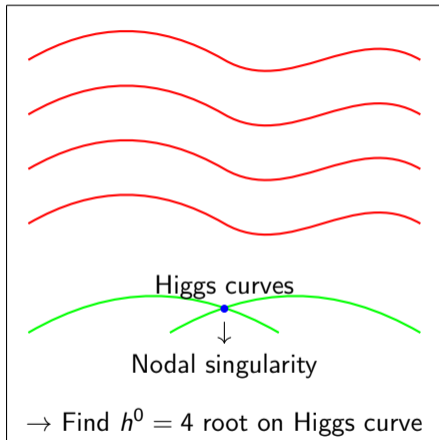
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- On nodal curves: Root bundle constructions known. [Caporaso Casagrande Cornalba '04]
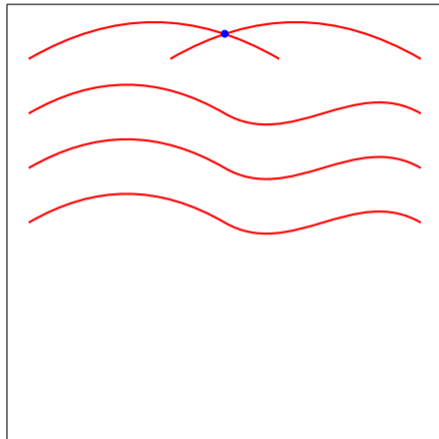
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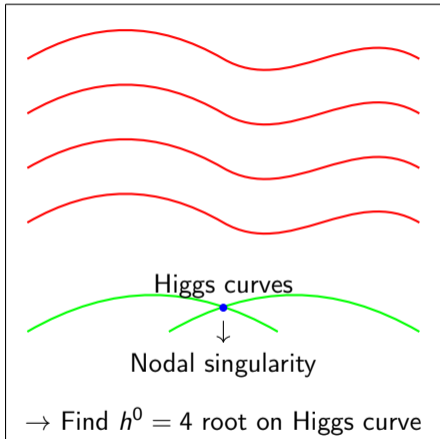
Nodal singularity

$\rightarrow$ Find $h^0 = 4$ root on Higgs curve

Proposal of MSSM construction

Good physics geometry X_{nodal}

Artifical deform
$\longrightarrow$

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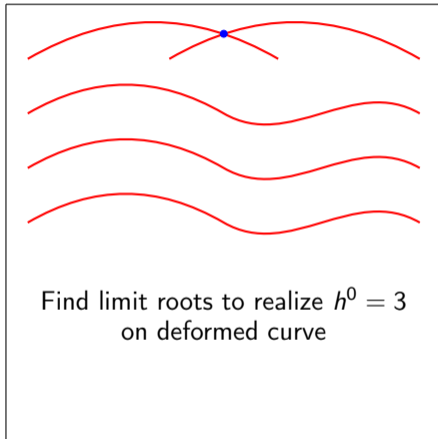
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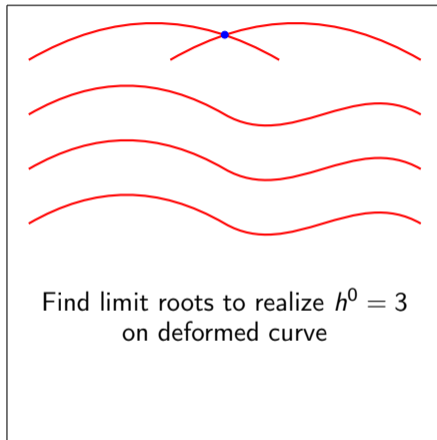
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Artifical deform →

By upper semi-continuity ← h^0 remains 3

Left panel:

Higgs curves

↓

Nodal singularity

→ Find $h^0 = 4$ root on Higgs curve

Right panel:

Find limit roots to realize $h^0 = 3$ on deformed curve
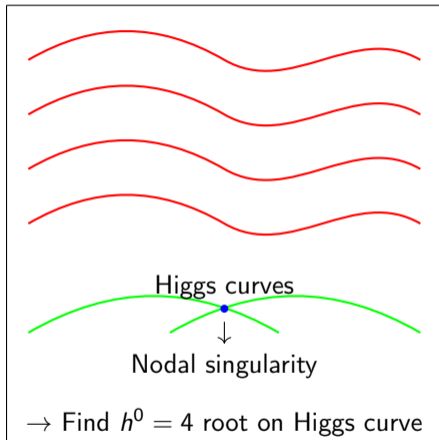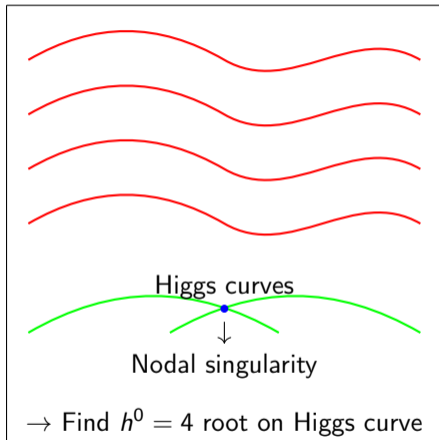
• Anticipate complete MSSM vector-like spectra in good geometry X_{nodal}

Outlook

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- Conceptual question:

  intermediate Jacobian $\leftrightarrow$ root/spin bundles.

Thank you for your attention!