

Adams spectral sequence

$$Ext_A^{s,t}(\mathbb{Z}/p, \mathbb{Z}/p) \Rightarrow (\pi_{t-s}^S)_p$$

$[p=2]$

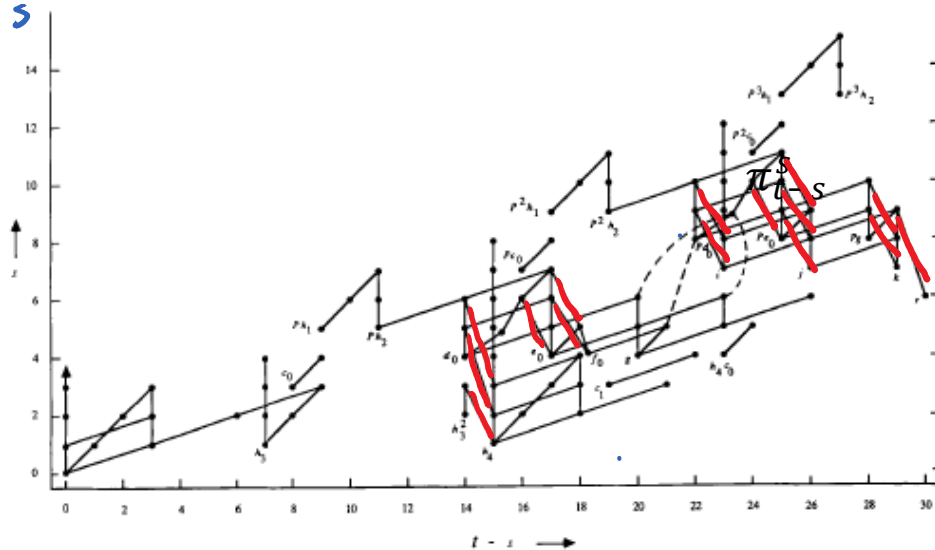
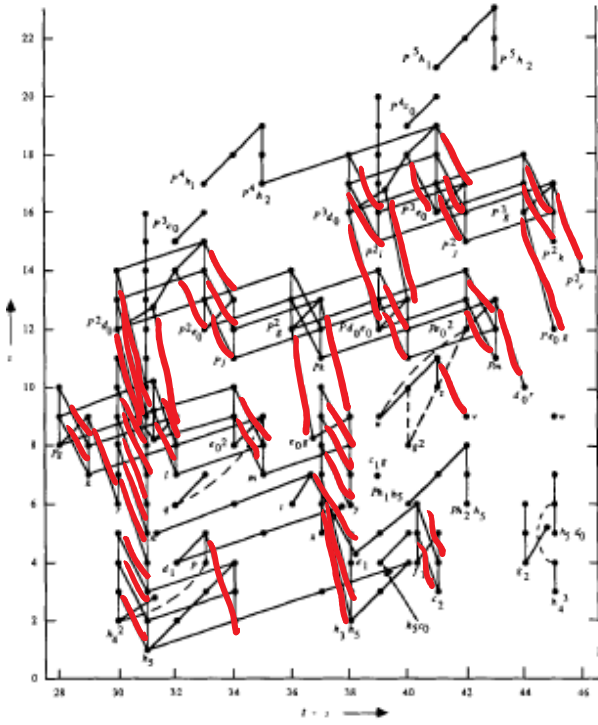


Figure A3.1a The Adams spectral sequence for $p=2, t-s \leq 29$.



$t-s$

- Many differentials
- d_r differentials go back by 1 and up by r .

Adams spectral sequence

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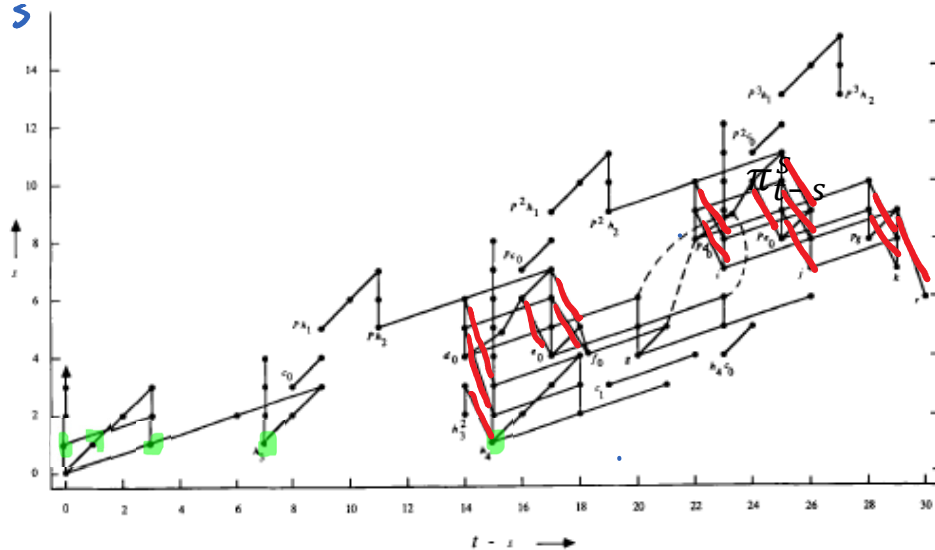
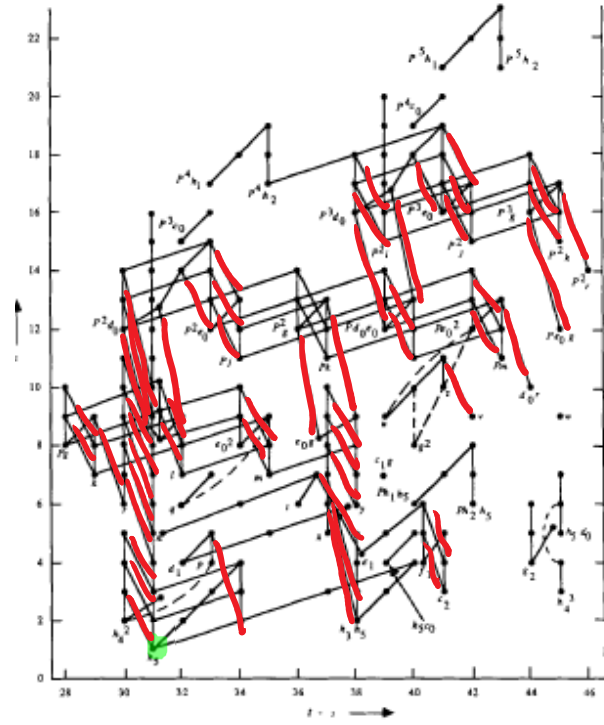


Figure A3.1a The Adams spectral sequence for $p=2, t-s \leq 29$.



$t-s$

$\square = H\mathbb{Z}/2$

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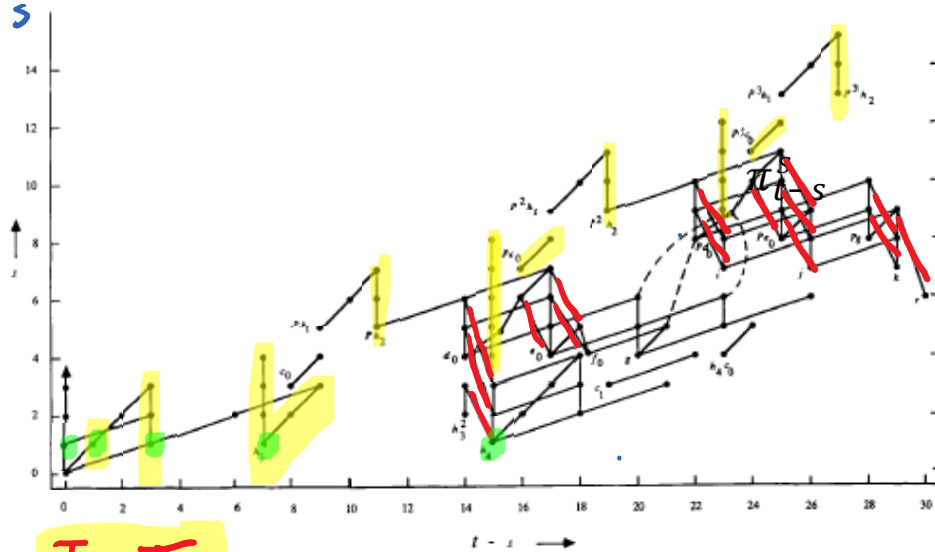
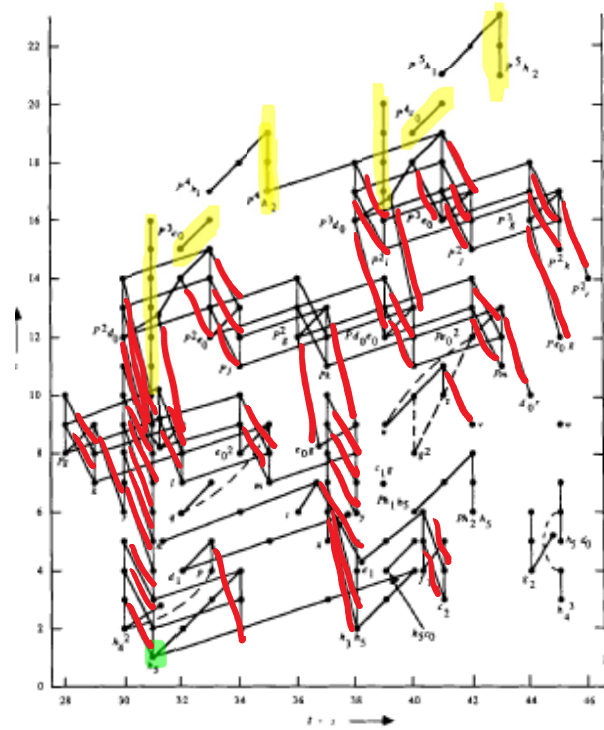


Figure A3.1a The Adams spectral sequence for $p=2, t-s \leq 29$.



$t-s$

$\blacksquare = HI L$

$Im J$

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$p=2$

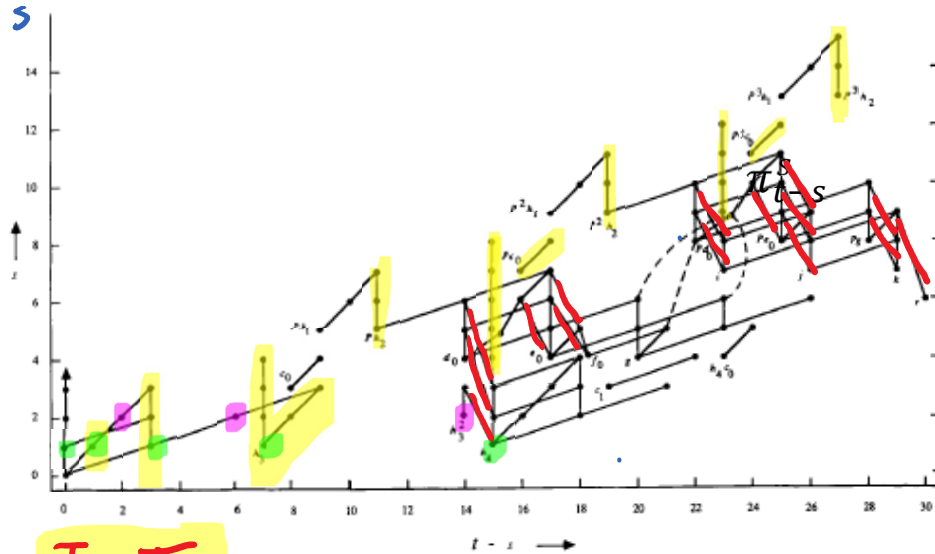
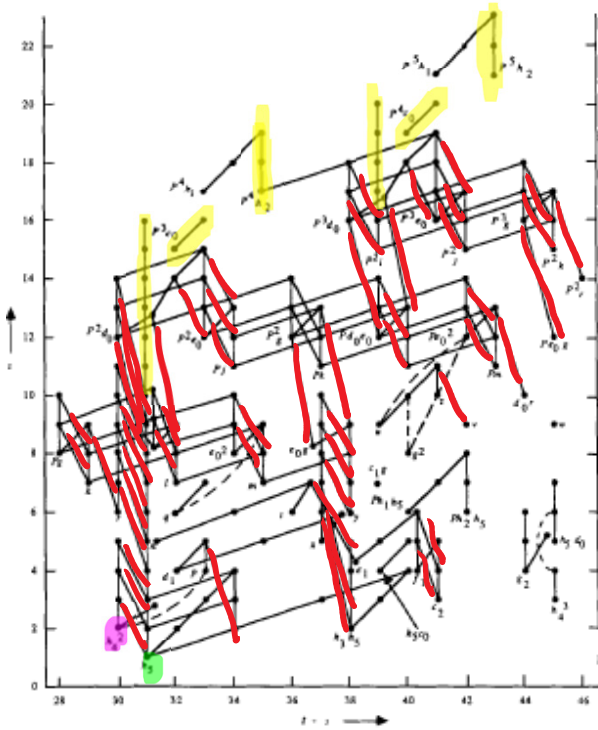


Figure A3.1a The Adams spectral sequence for $p=2, t-s \leq 29$.



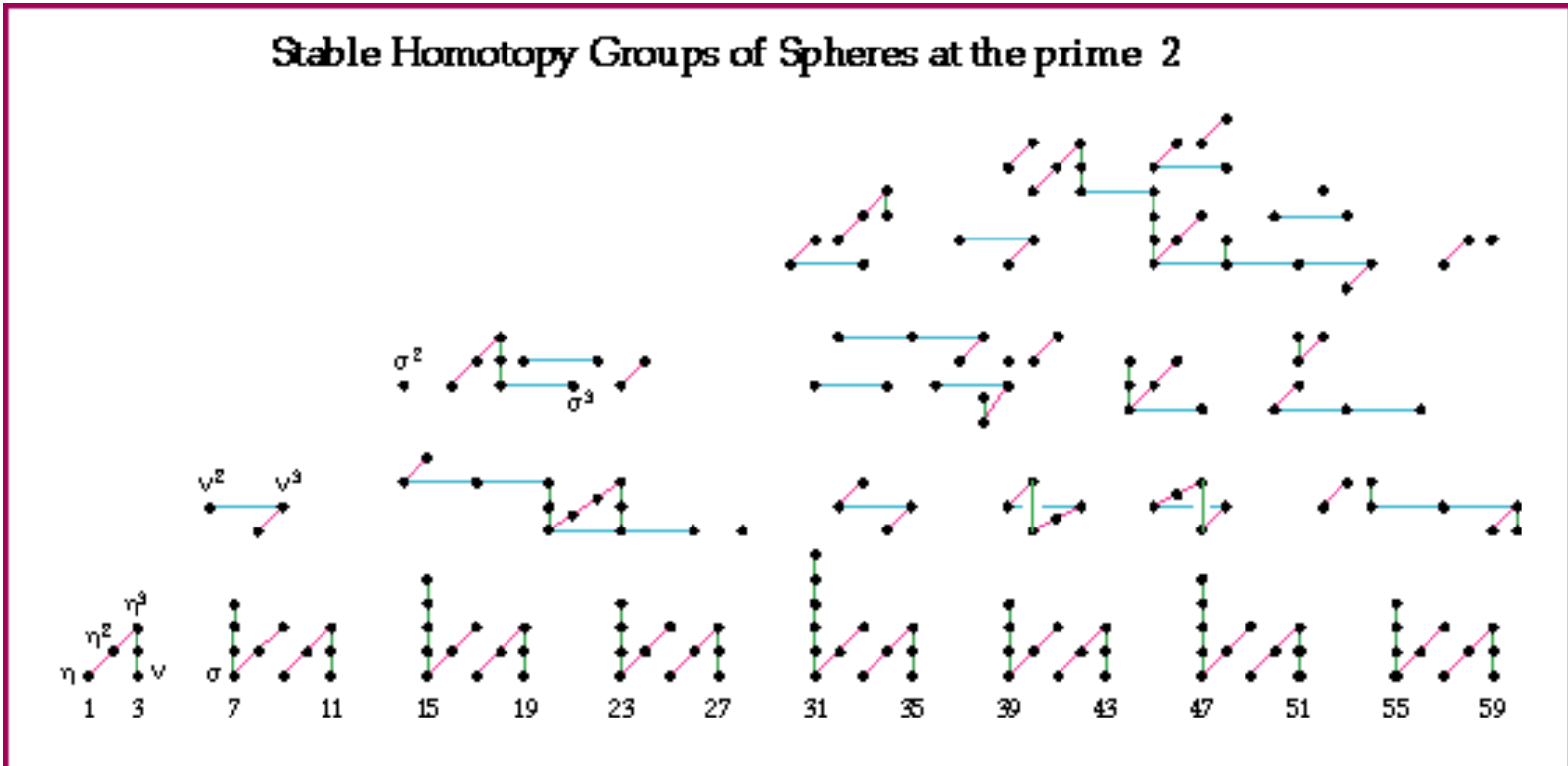
$t-s$

\blacksquare = HI 1

\blacksquare = Im \mathcal{J}

\blacksquare = Kervaire Invariant 1 $\cdot (\theta_j)$

Stable Homotopy Groups of Spheres at the prime 2

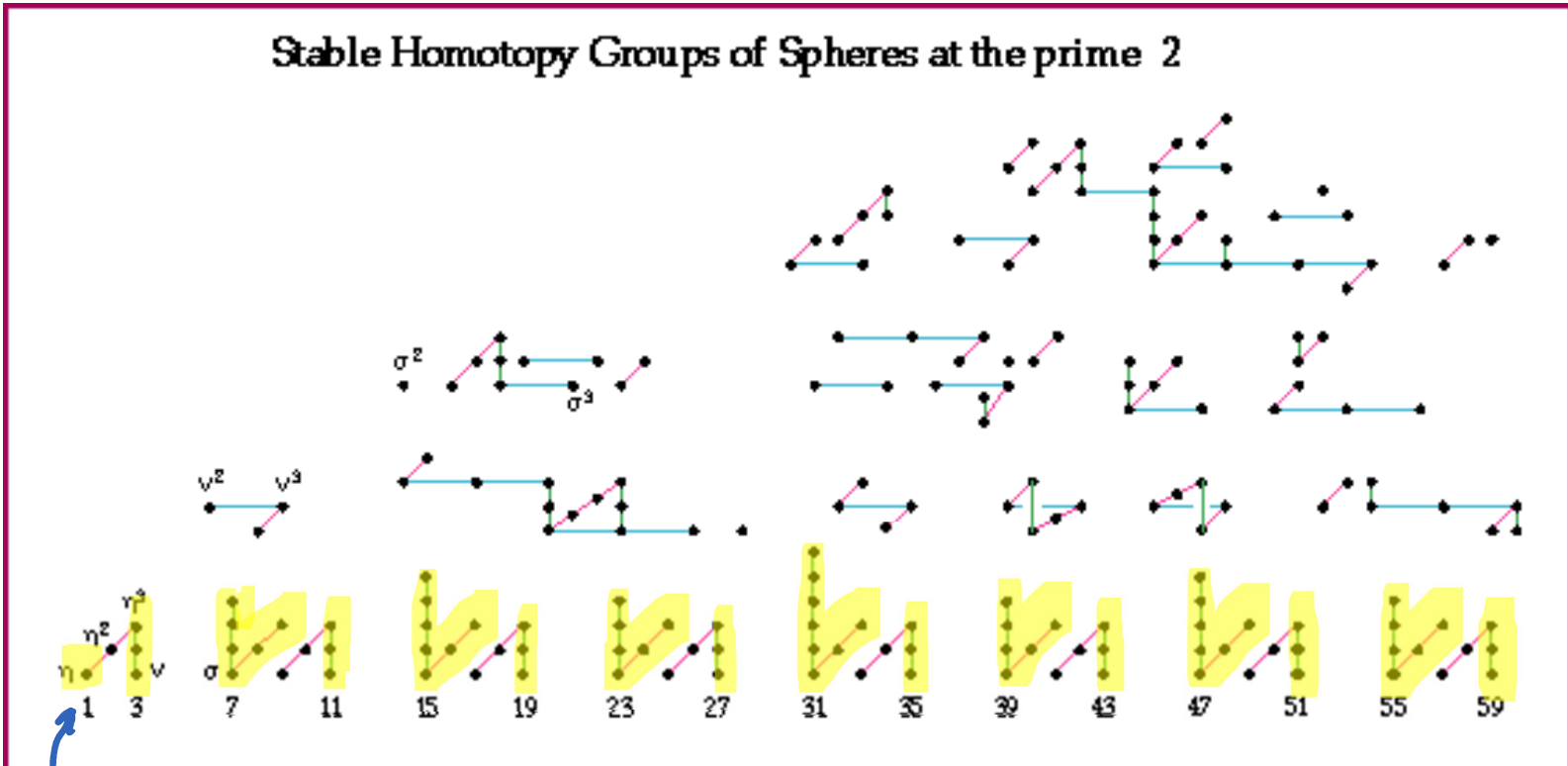


Computation: Mahowald-Tangora-Kochman

Picture: A. Hatcher

- Each dot represents a factor of 2, vertical lines indicate additive extensions
 e.g.: $(\pi_3^S)_{(2)} = \mathbb{Z}_8$, $(\pi_8^S)_{(2)} = \mathbb{Z}_2 \oplus \mathbb{Z}_2$
- Vertical arrangement of dots is arbitrary, but meant to suggest patterns

Stable Homotopy Groups of Spheres at the prime 2



Im J

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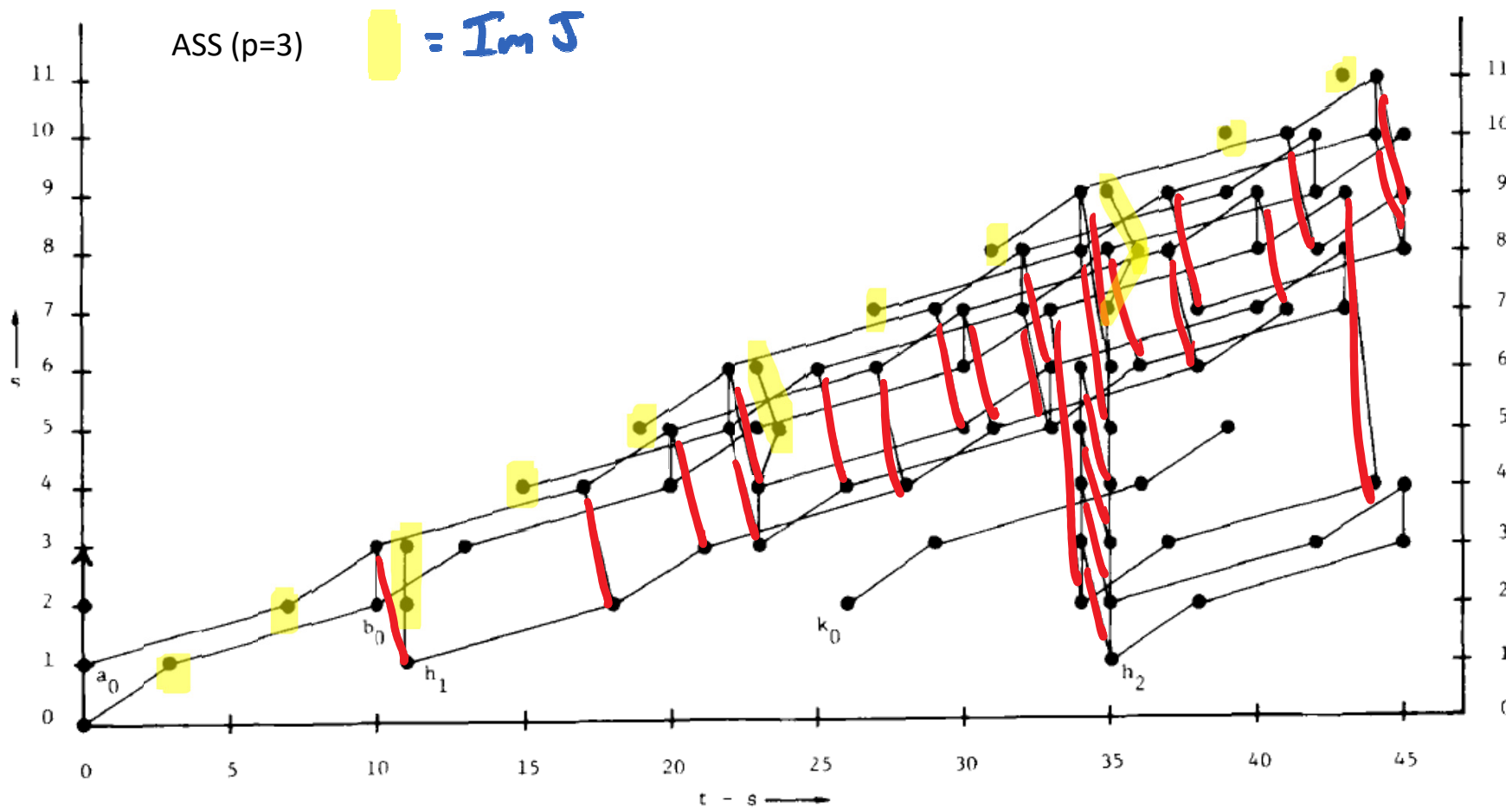
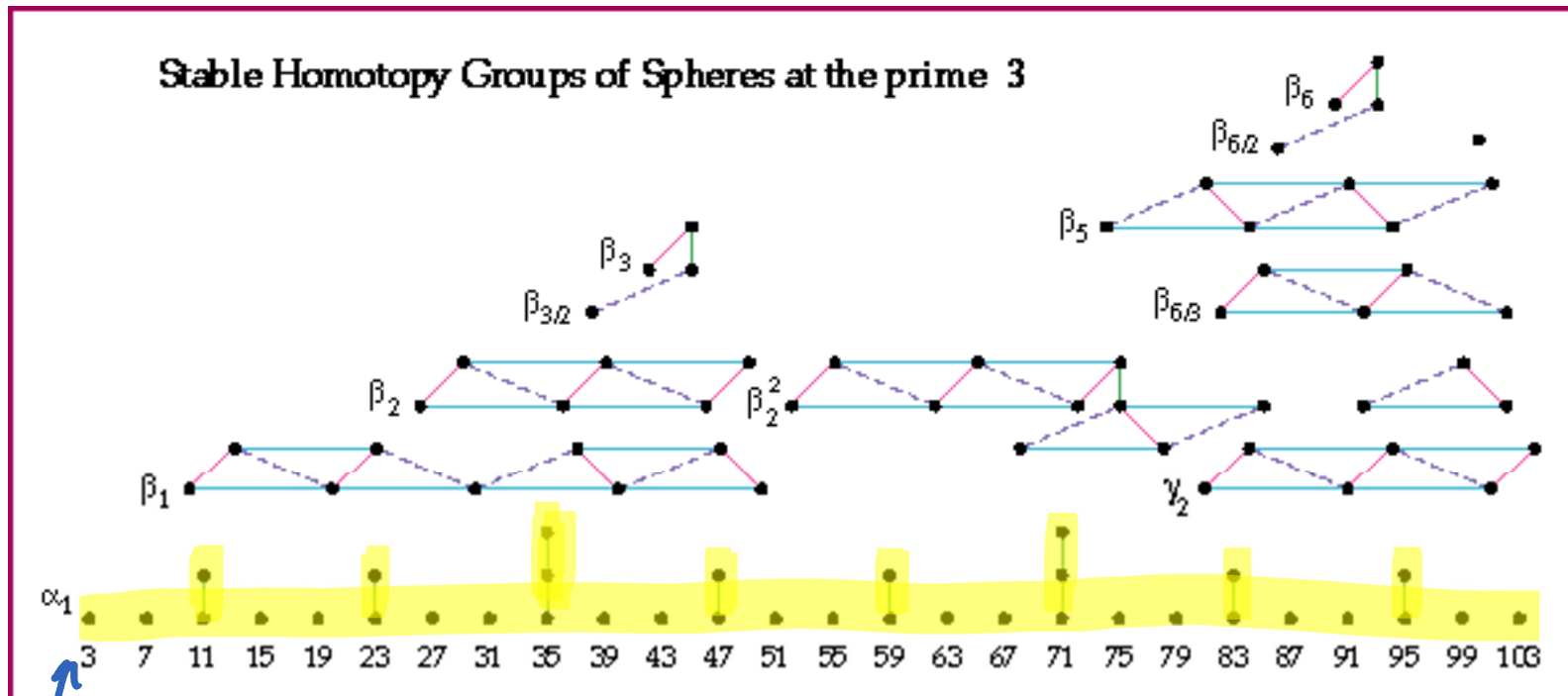


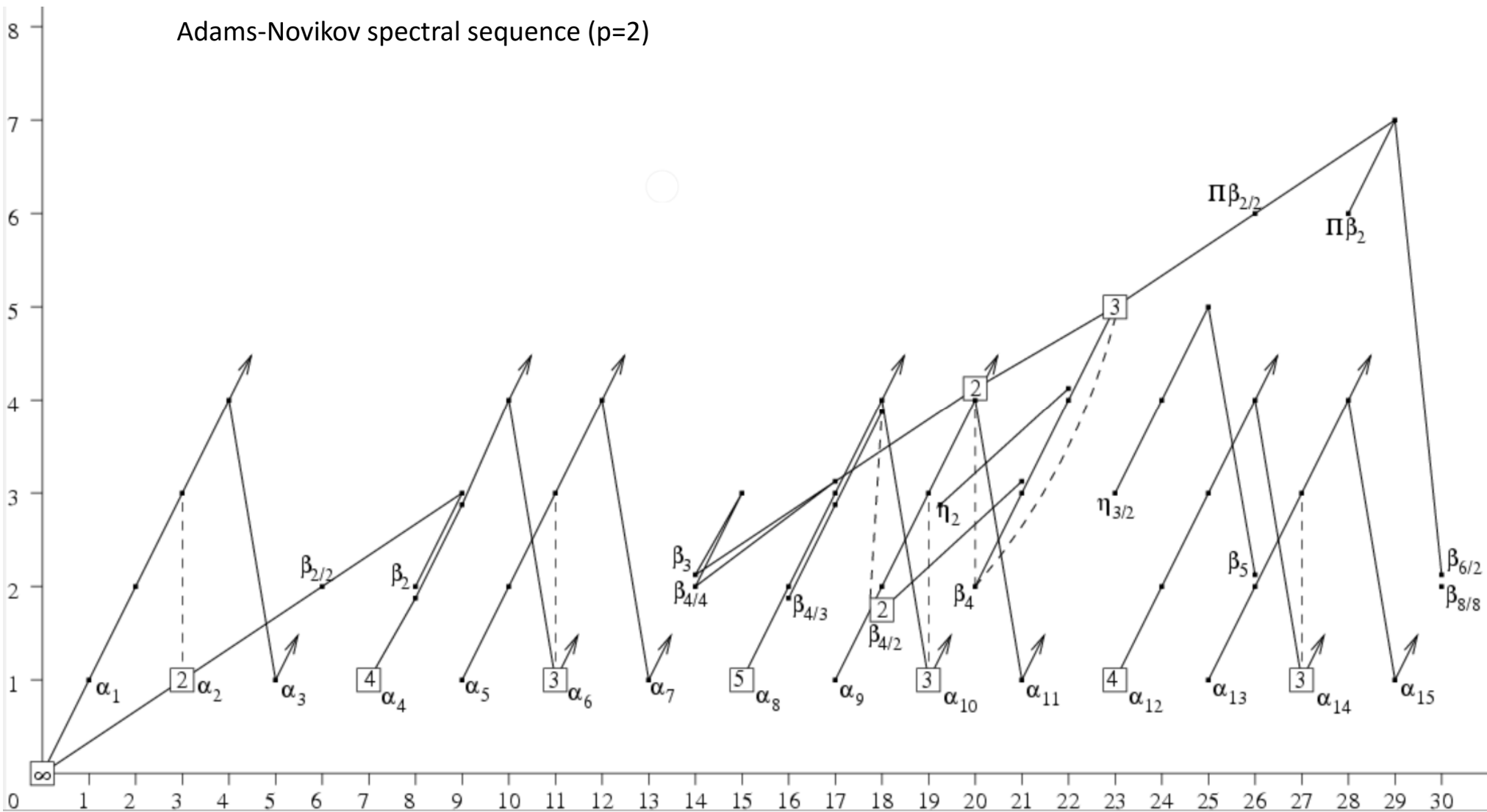
Figure 1.2.15 The Adams spectra sequence for $p = 3$, $t - s \leq 45$.

Computation: Nakamura -Tangora
 Picture: A. Hatcher



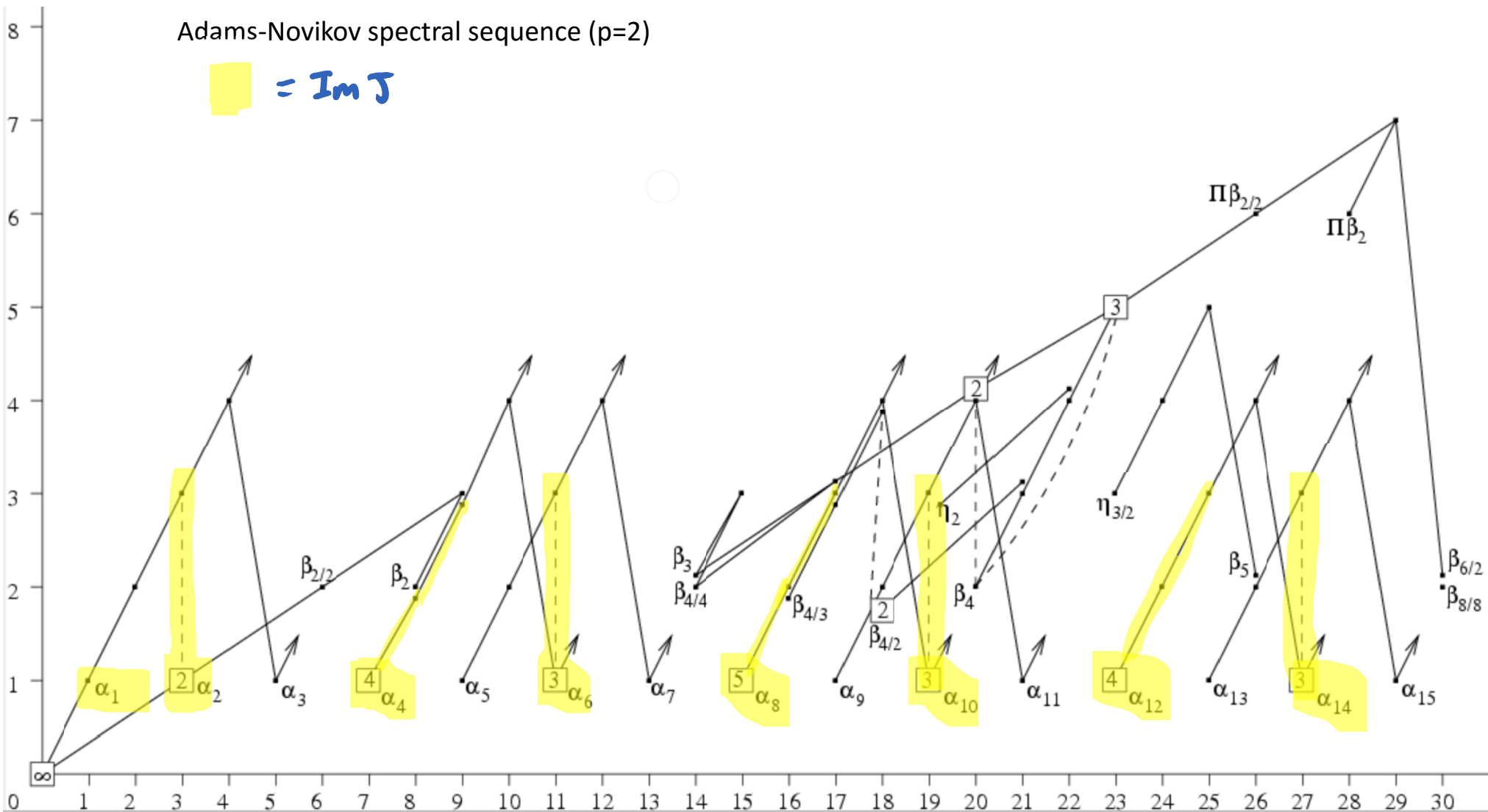
$\text{Im } J$

Adams-Novikov spectral sequence (p=2)



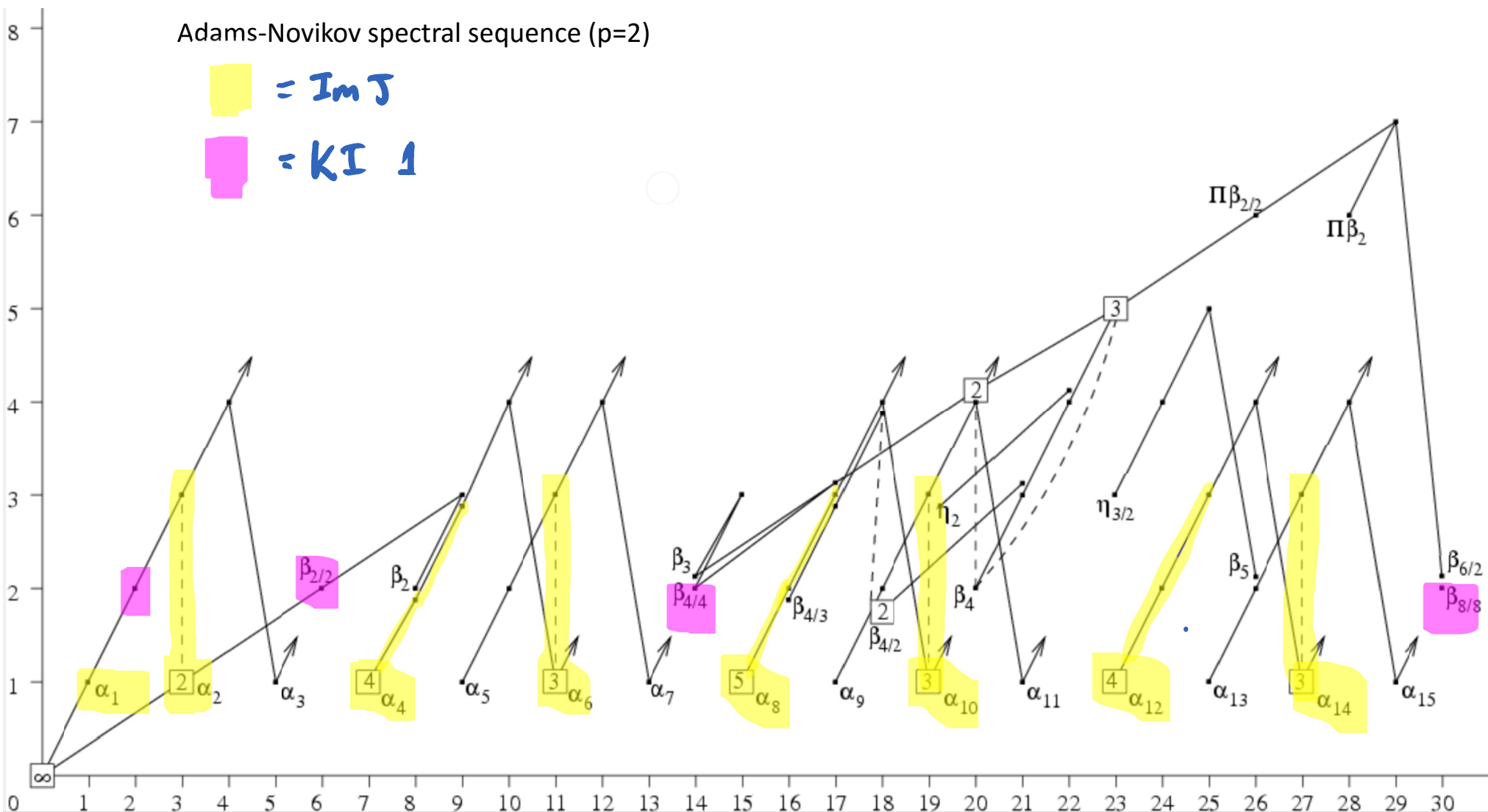
Adams-Novikov spectral sequence (p=2)

 = $Im J$



Adams-Novikov spectral sequence (p=2)

= $Im J$
 = KI 1



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$p=2$

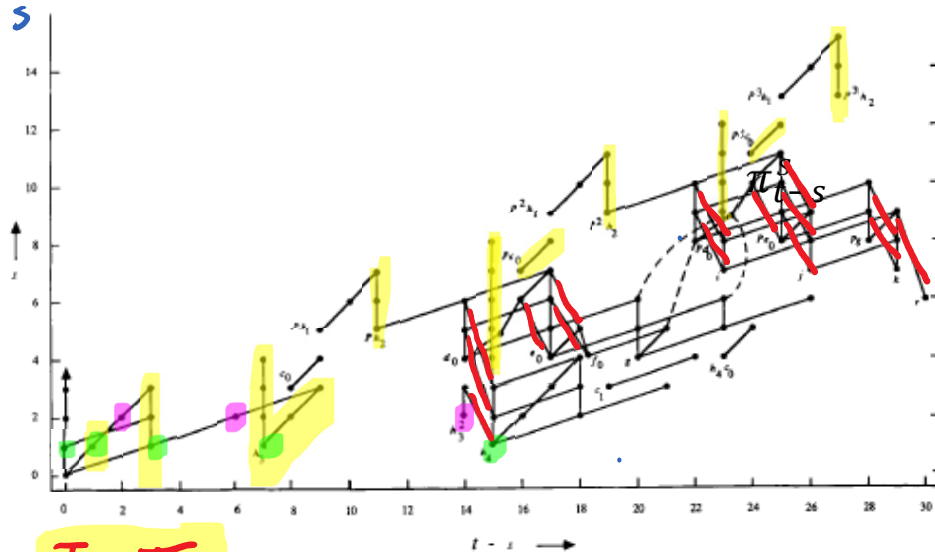
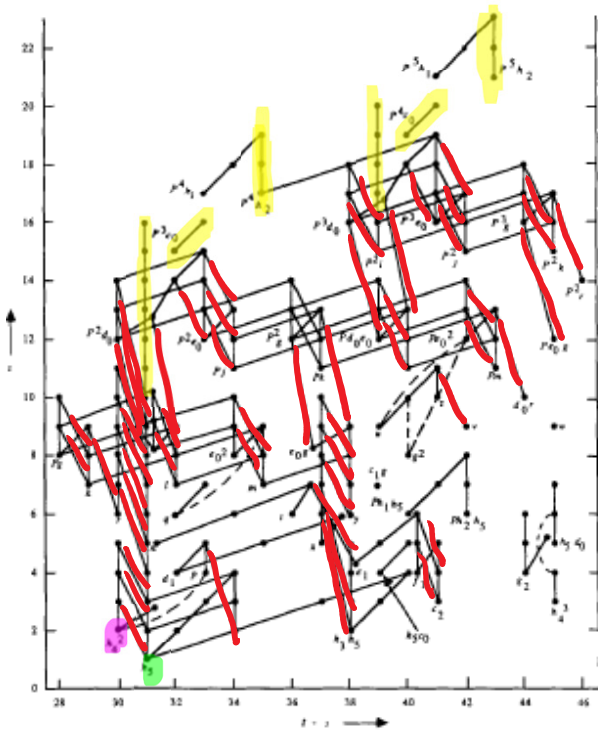


Figure A3.1a The Adams spectral sequence for $p=2, t-s \leq 29$.



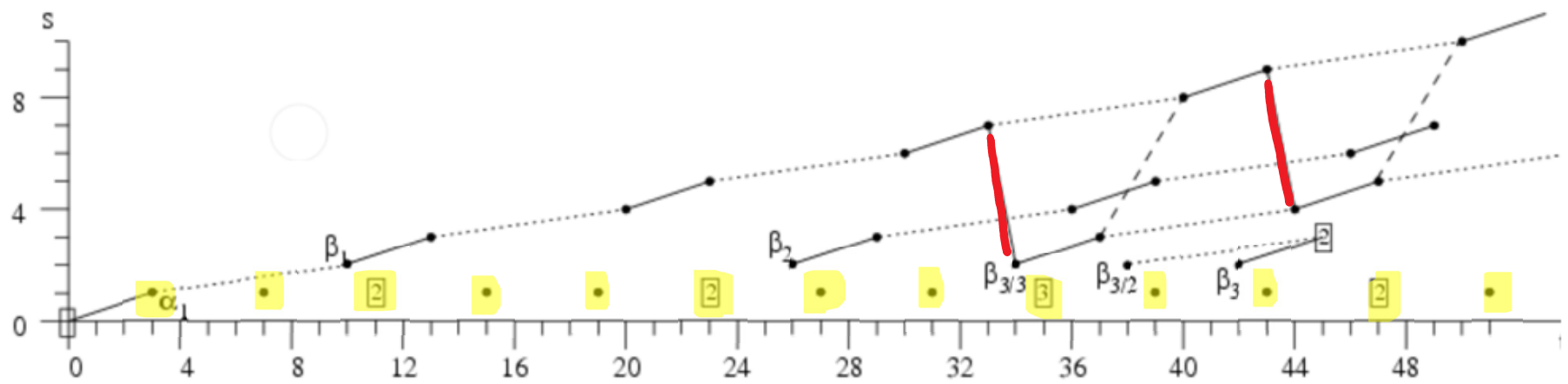
$t-s$

■ = HI 1

■ = Im J

■ = Kervaire Invariant 1 · (θ_j)

ANSS ($p=3$) = $\text{Im } J$



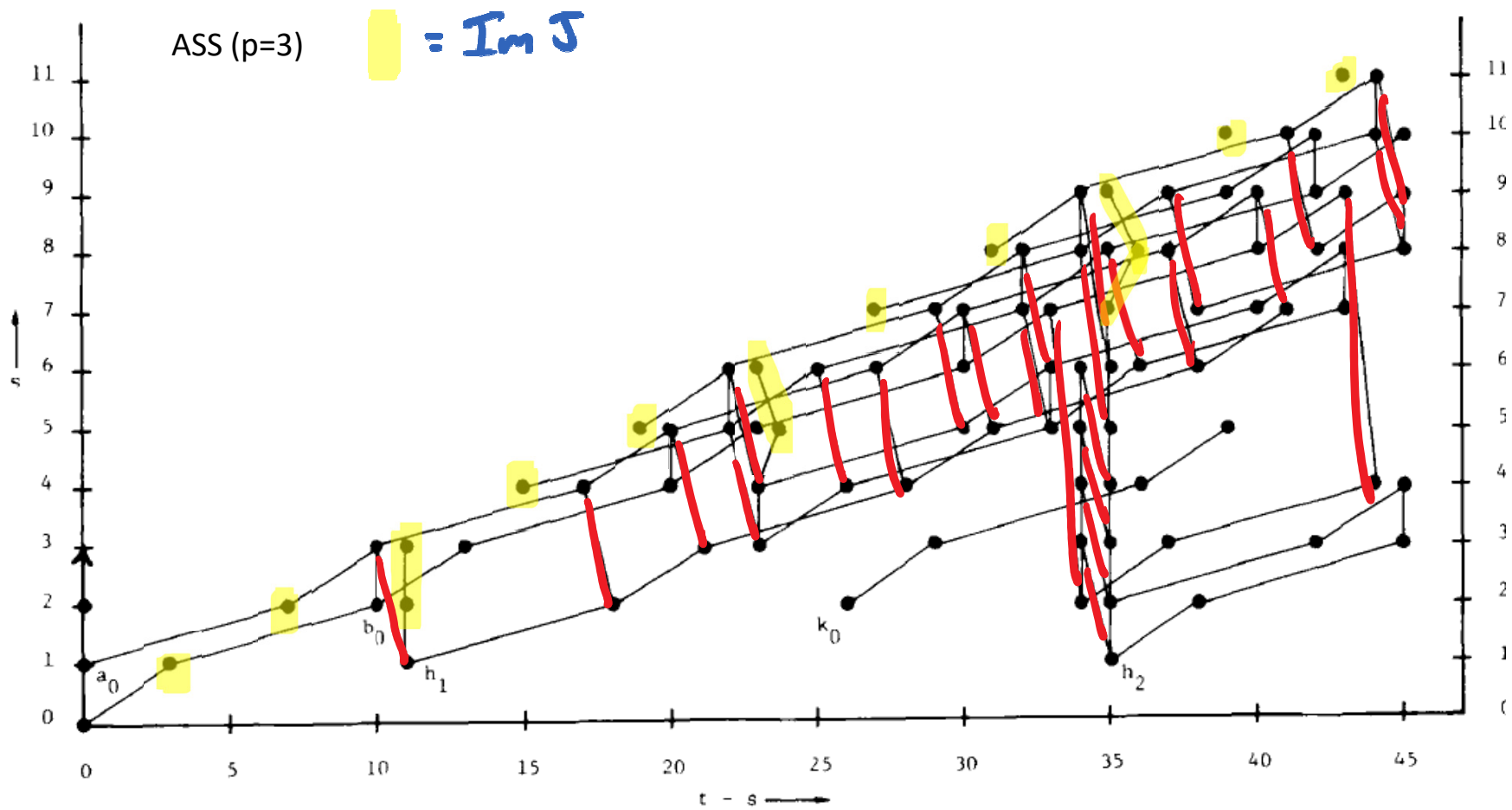


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ANSS (p=3)

