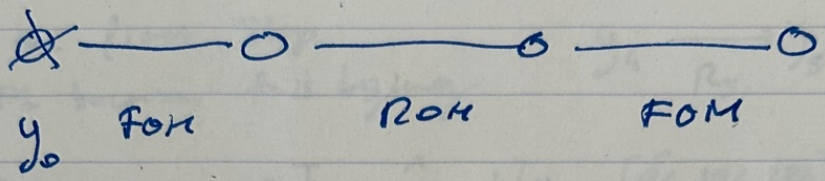
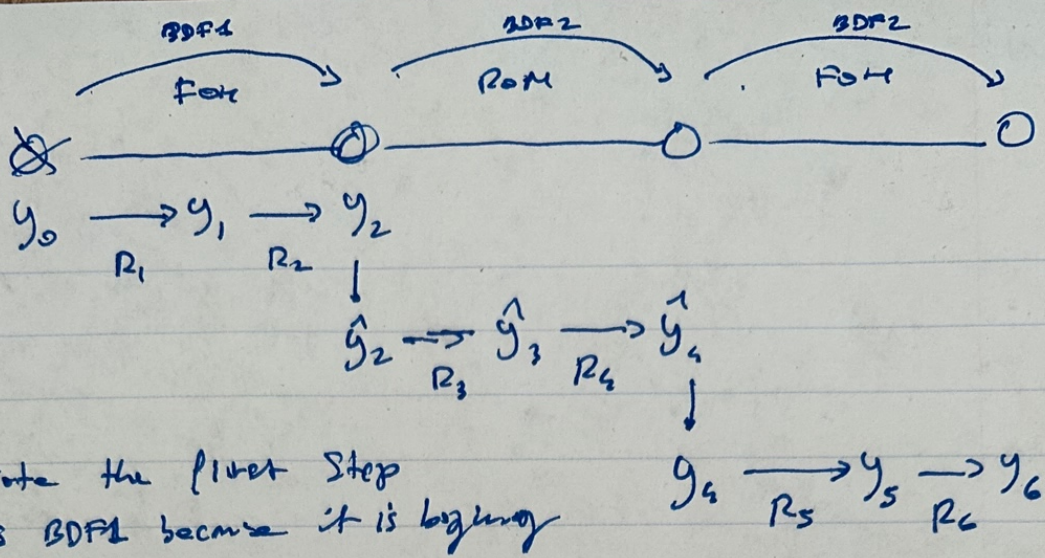
MIXED FOM-ROM (LSPG) with BDF2



$$y_0 = \begin{bmatrix} 10 \\ \vdots \\ 10 \end{bmatrix}$$

MAIN2_BDF2.CC



Note the first step is BDF1 because it is beginning

$y_0 = [10 \dots \dots 10]^T$

$y_1 = [11 \dots \dots 11]^T$

$y_2 = [12 \dots \dots 12]^T$

$\hat{y}_2 = \phi^T y_2 = [96\ 192\ 288]^T$

$\hat{y}_3 = [97\ 193\ 289]$

$\hat{y}_4 = \hat{y}_3 + 1$

$y_4 = \phi \hat{y}_4 = [1356 \dots \dots]^T$

$y_5 = y_4 + 1$

$y_6 = y_5 + 1$

$R_1 = y_1 - y_0 - hf = [-2 \dots \dots -2]^T$

$R_2 = y_1 - y_0 - hf = [-1 \dots \dots -1]^T$

$R_3 = \phi\phi^T y_2 - \frac{4}{3}\phi\phi^T y_2 + \frac{1}{3}\phi\phi^T y_0 - \frac{2}{3}hf$

$= [-76 \dots \dots -76]$

$R_4 = \phi\hat{y}_3 - \frac{4}{3}\phi\phi^T y_2 + \frac{1}{3}\phi\phi^T y_0 - \frac{2}{3}hf$

$= [-70 \dots \dots -70]$

$R_5 = y_4 - \frac{4}{3}y_4 + \frac{1}{3}\phi\hat{y}_2 - \frac{2}{3}hf$

$= [-16/3 \dots \dots -16/3]$

$R_6 = y_5 - \frac{4}{3}y_6 + \frac{1}{3}\phi\hat{y}_2 - \frac{2}{3}hf$

$= [-13/3 \dots \dots -13/3]$