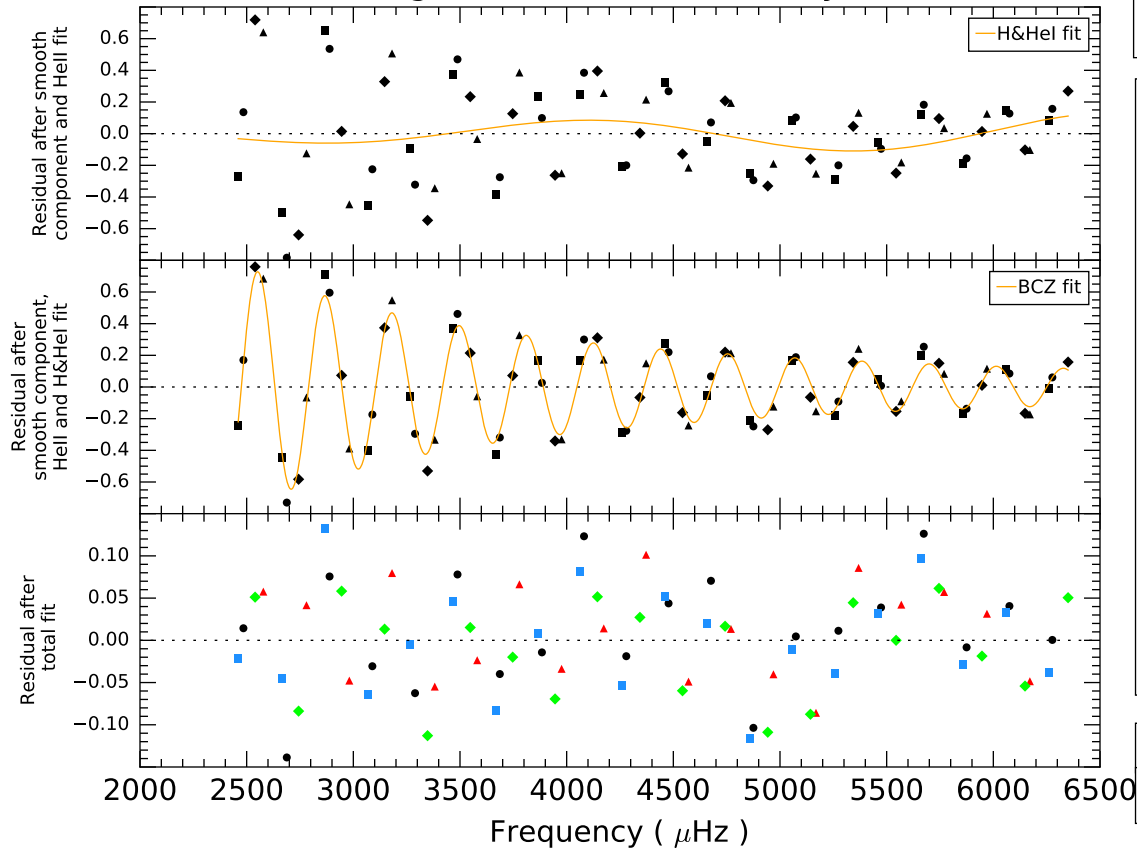


# Age after ZAMS: 0.000 Gyr



$$a_0 = -8.4803 \mu\text{Hz}$$

$$a_1 = 0.0034206$$

$$a_2 = -3.2805e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0013101$$

$$c_2 = 1.58e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 441.88 \text{ s}$$

$$\phi_{\text{HeII}} = 3.656$$

$$b_2 = 4.7409e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1589.0 \text{ s}$$

$$\phi_{\text{CZ}} = 0.85283$$

$$d_0 = 2.1221e-05$$

$$d_2 = 1.118e-09 \mu\text{Hz}^{-2}$$

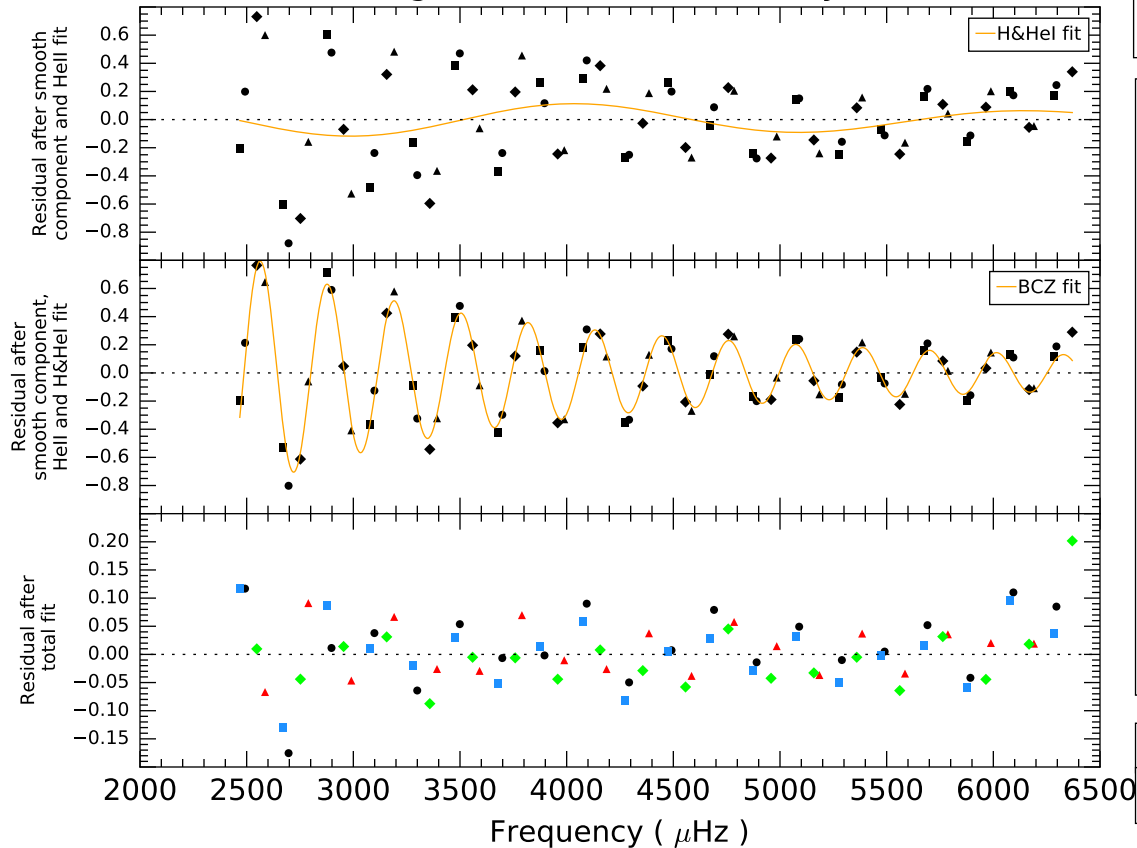
$$\tau_{\text{HI}} = 200.67 \text{ s}$$

$$\phi_{\text{HI}} = 3.878$$

profile1

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0045471$$

# Age after ZAMS: 0.000 Gyr



- $\bullet$   $\ell = 0$
- $\blacktriangle$   $\ell = 1$
- $\blacksquare$   $\ell = 2$
- $\blacklozenge$   $\ell = 3$

$$a_0 = -8.5931 \mu \text{ Hz}$$

$$a_1 = 0.0034765$$

$$a_2 = -3.3528e-07 \mu\text{Hz}^{-1}$$

$$c_0 = 0.0013616$$

$$c_2 = 1.5804e-07 \mu\text{Hz}^{-2}$$

$$\tau_{HeII} = 427.79 \text{ s}$$

$$\phi_{HeII} = 4.1348$$

$$b_2 = 5.2219e+06 \text{ mHz}^3$$

$$\tau_{CZ} = 1594.0 \text{ s}$$

$$\phi_{CZ} = 0.45497$$

$$d_0 = 5.9543e-05$$

$$d_2 = 4.622e-08 \mu\text{Hz}^{-2}$$

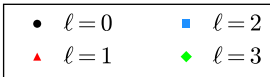
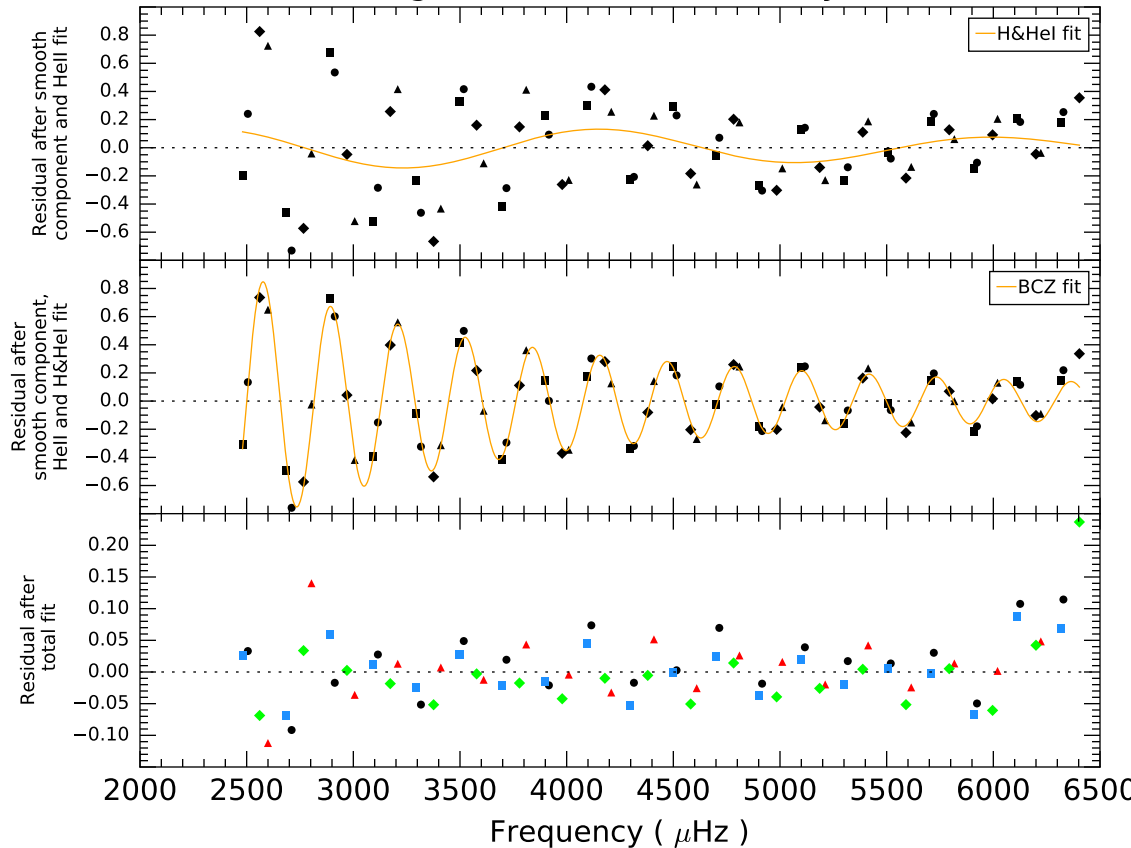
$$\tau_{HI} = 233.87 \text{ s}$$

$$\phi_{HI} = 2.2345$$

profile2

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0042631$$

# Age after ZAMS: 0.001 Gyr

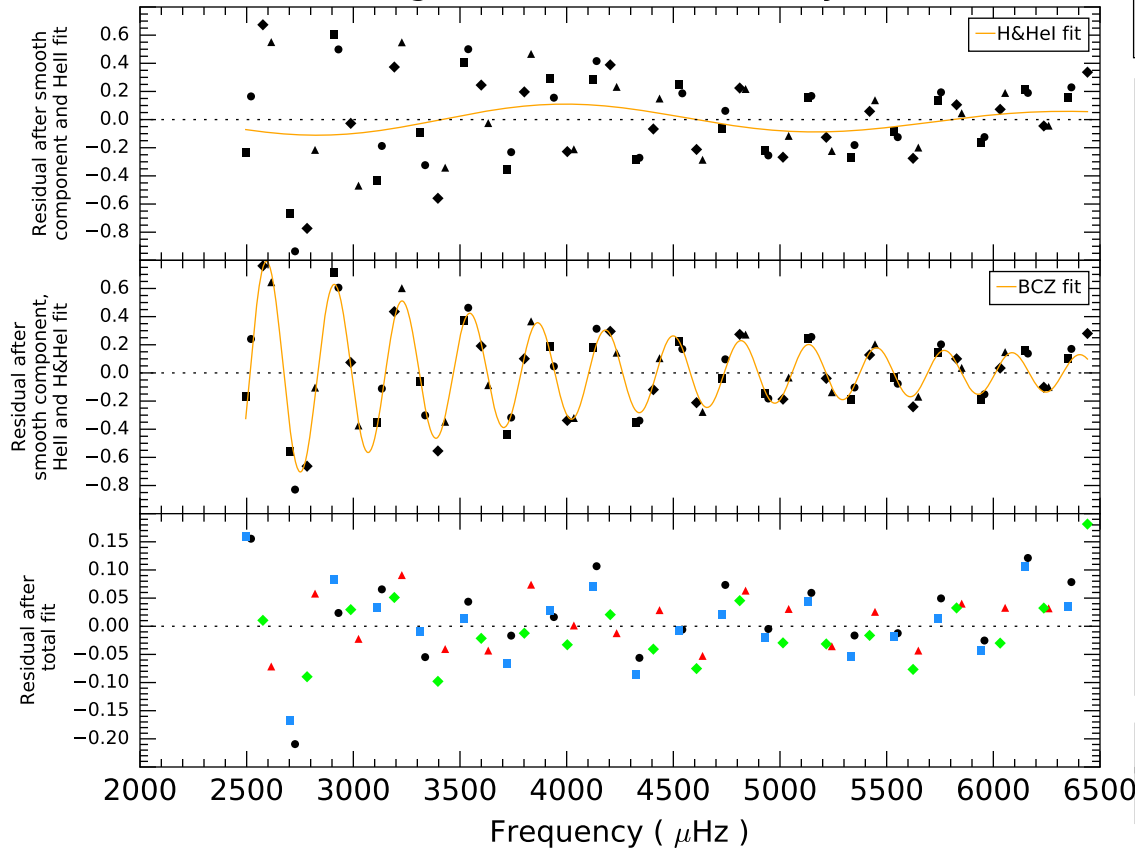


$$\begin{aligned}
 a_0 &= -8.4936 \mu \text{ Hz} \\
 a_1 &= 0.0034229 \\
 a_2 &= -3.2904e-07 \mu \text{ Hz}^{-2} \\
 c_0 &= 0.0015205 \\
 c_2 &= 1.6943e-07 \mu \text{ Hz}^{-2} \\
 \tau_{HeII} &= 436.64 \text{ s} \\
 \phi_{HeII} &= 3.5759 \\
 b_2 &= 5.6309e+06 \text{ mHz}^3 \\
 \tau_{CZ} &= 1584.6 \text{ s} \\
 \phi_{CZ} &= 0.48565 \\
 d_0 &= 7.4592e-05 \\
 d_2 &= 4.9383e-08 \mu \text{ Hz}^{-2} \\
 \tau_{HI} &= 268.72 \text{ s} \\
 \phi_{HI} &= 0.071907
 \end{aligned}$$

profile3

$$\chi^2_\nu(\text{dof} = 65) = 0.0033828$$

# Age after ZAMS: 0.002 Gyr



$$a_0 = -8.8878 \mu \text{ Hz}$$

$$a_1 = 0.0035408$$

$$a_2 = -3.3654e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0012264$$

$$c_2 = 1.4728e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 412.57 \text{ s}$$

$$\phi_{\text{HeII}} = 4.5402$$

$$b_2 = 5.3331e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1574.2 \text{ s}$$

$$\phi_{\text{CZ}} = 0.5085$$

$$d_0 = 5.6127e-05$$

$$d_2 = 4.4547e-08 \mu\text{Hz}^{-2}$$

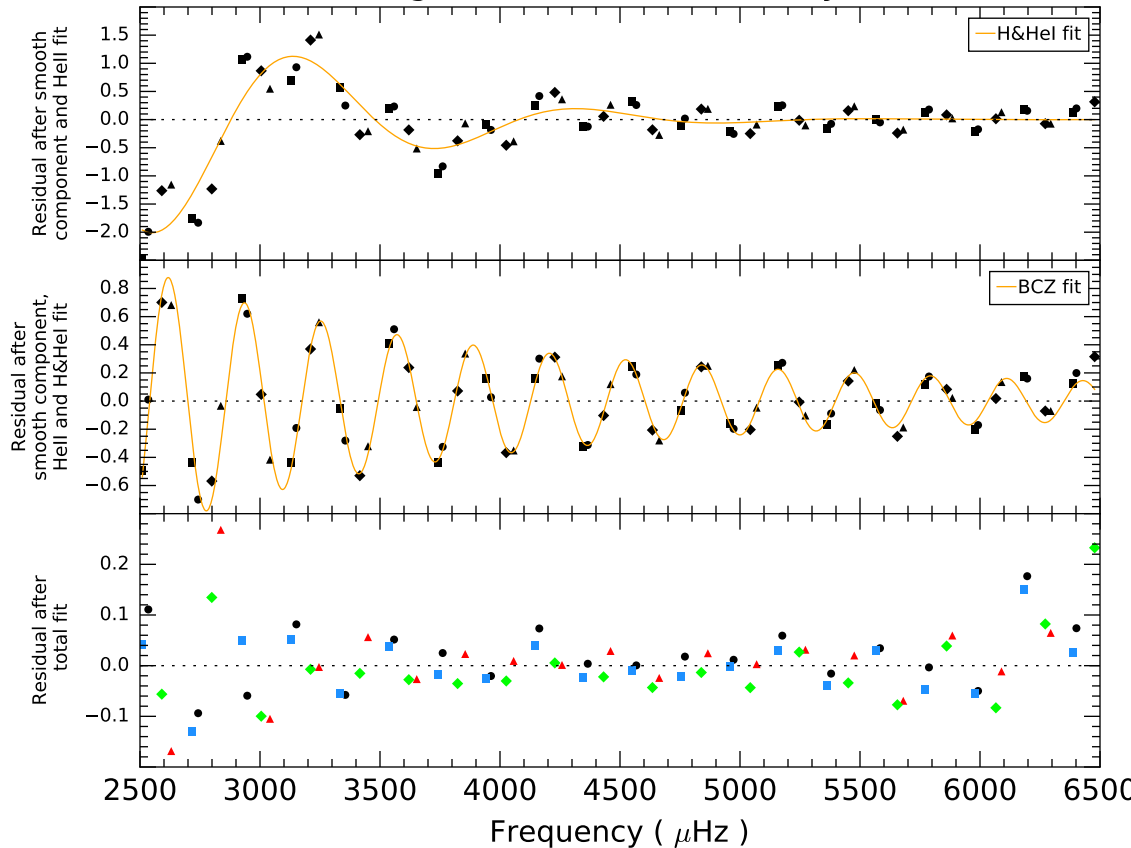
$$\tau_{\text{HI}} = 209.31 \text{ s}$$

$$\phi_{\text{HI}} = 3.5934$$

profile4

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0053006$$

# Age after ZAMS: 0.004 Gyr



$$a_0 = -7.8382 \mu \text{ Hz}$$

$$a_1 = 0.0030968$$

$$a_2 = -2.9138e-07 \mu\text{Hz}^{-1}$$

$$c_0 = 0.0007008$$

$$c_2 = 1.3517e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 301.71 \text{ s}$$

$$\phi_{\text{HeII}} = 4.562$$

$$b_2 = 6.0189e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1574.8 \text{ s}$$

$$\phi_{\text{CZ}} = 6.2824$$

$$d_0 = 0.003618$$

$$d_2 = 2.3253e-07 \mu\text{Hz}^{-2}$$

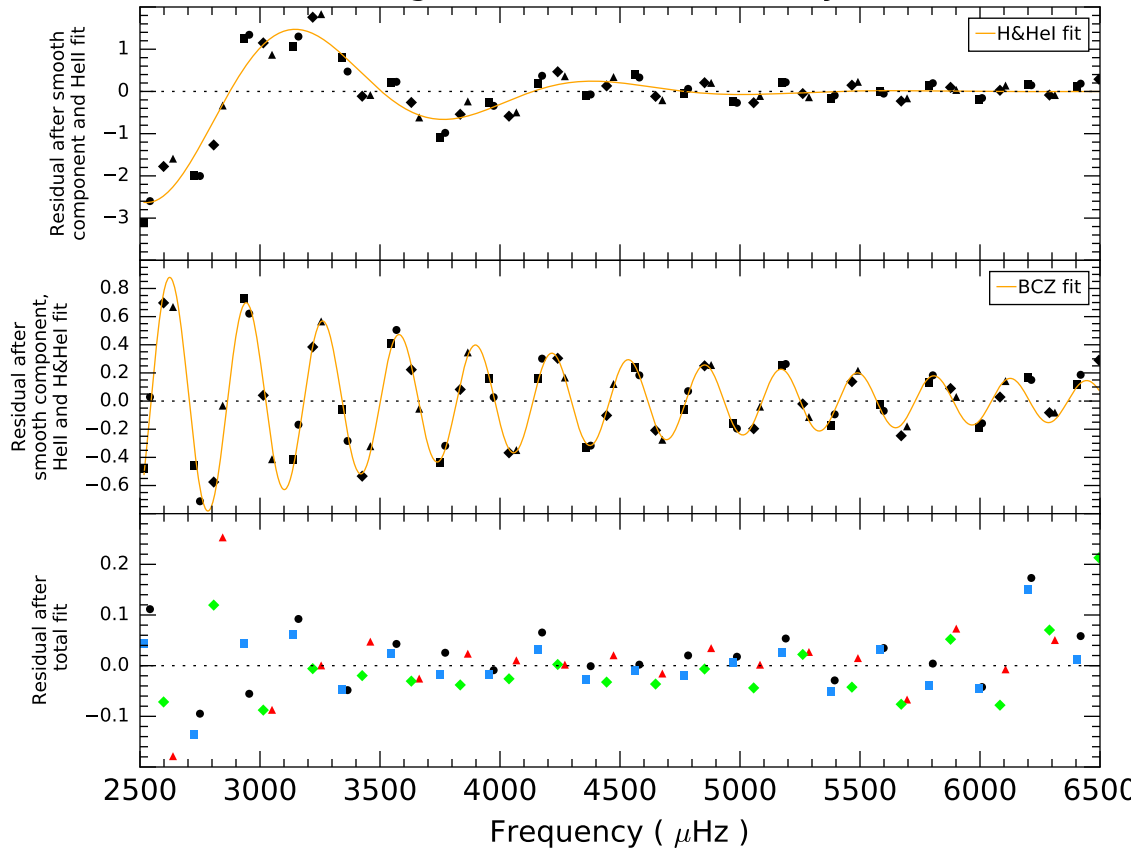
$$\tau_{\text{HI}} = 417.12 \text{ s}$$

$$\phi_{\text{HI}} = 3.7605$$

profile5

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0061574$$

# Age after ZAMS: 0.007 Gyr



- $\bullet$   $\ell = 0$
- $\blacktriangle$   $\ell = 1$
- $\blacksquare$   $\ell = 2$
- $\blacklozenge$   $\ell = 3$

$$a_0 = -7.5995 \mu \text{ Hz}$$

$$a_1 = 0.0029856$$

$$a_2 = -2.7915e-07 \mu \text{ Hz}^{-2}$$

$$c_0 = 0.0016499$$

$$c_2 = 1.7419e-07 \mu \text{ Hz}^{-2}$$

$$\tau_{\text{HeII}} = 304.63 \text{ s}$$

$$\phi_{\text{HeII}} = 4.6756$$

$$b_2 = 6.0557e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1570.9 \text{ s}$$

$$\phi_{\text{CZ}} = 0.0044586$$

$$d_0 = 0.0044244$$

$$d_2 = 2.2459e-07 \mu \text{ Hz}^{-2}$$

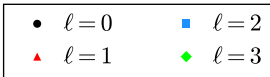
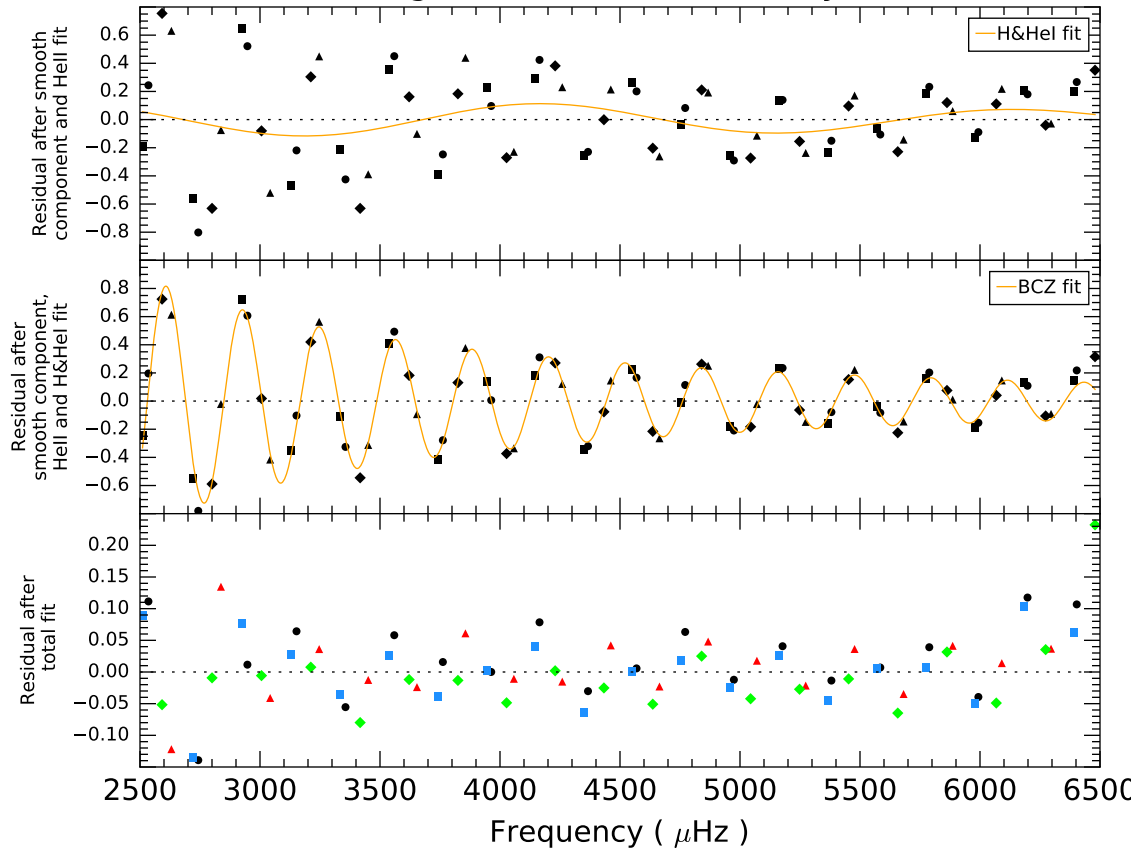
$$\tau_{\text{HI}} = 395.87 \text{ s}$$

$$\phi_{\text{HI}} = 4.5515$$

profile6

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0056838$$

# Age after ZAMS: 0.013 Gyr

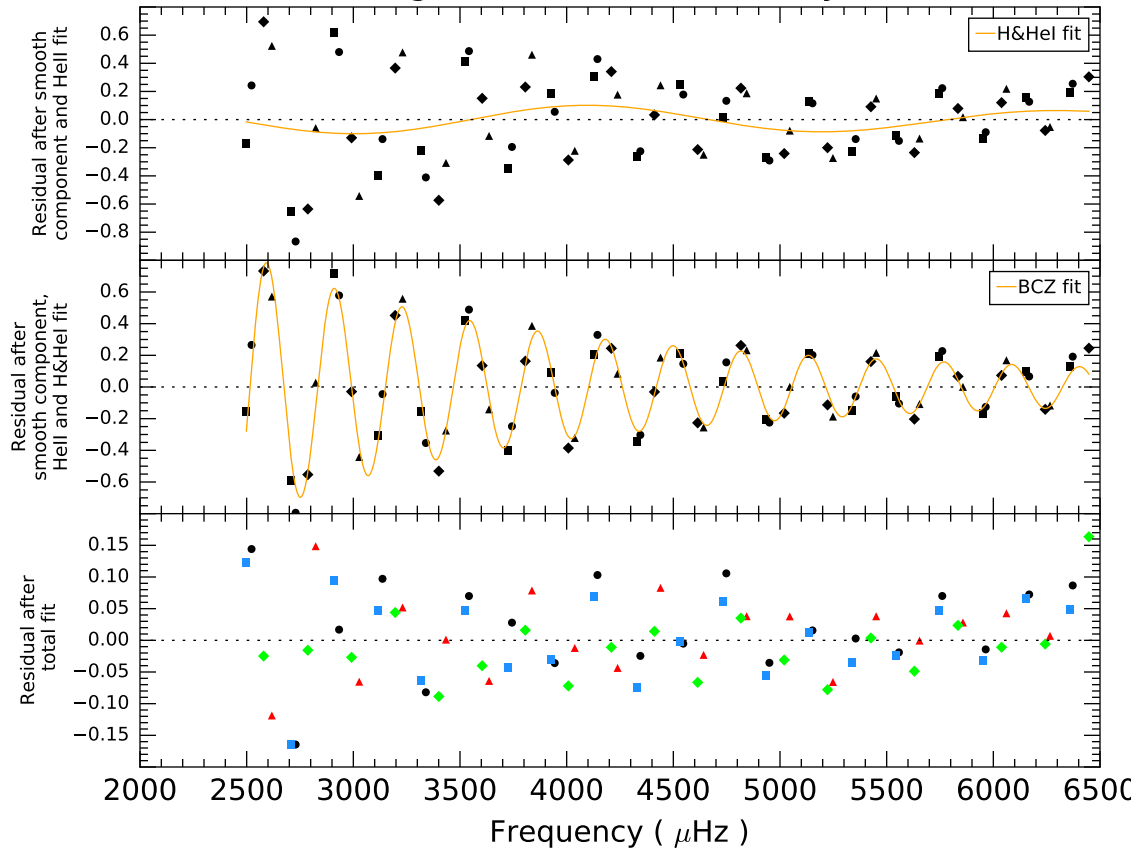


$$\begin{aligned}
 a_0 &= -8.7064 \mu \text{ Hz} \\
 a_1 &= 0.0034565 \\
 a_2 &= -3.277e-07 \mu \text{ Hz}^{-1} \\
 c_0 &= 0.0013334 \\
 c_2 &= 1.5563e-07 \mu \text{ Hz}^{-2} \\
 \tau_{HeII} &= 421.36 \text{ s} \\
 \phi_{HeII} &= 3.9548 \\
 b_2 &= 5.5573e+06 \text{ mHz}^3 \\
 \tau_{CZ} &= 1569.0 \text{ s} \\
 \phi_{CZ} &= 0.3806 \\
 d_0 &= 5.5348e-05 \\
 d_2 &= 4.0912e-08 \mu \text{ Hz}^{-2} \\
 \tau_{HI} &= 250.88 \text{ s} \\
 \phi_{HI} &= 0.97378
 \end{aligned}$$

profile7

$$\chi^2_\nu(\text{dof} = 65) = 0.0043121$$

Age after ZAMS: 0.023 Gyr



$$a_0 = -8.628 \mu \text{ Hz}$$

$$a_1 = 0.0034309$$

$$a_2 = -3.2545e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0012182$$

$$c_2 = 1.4914e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 423.28 \text{ s}$$

$$\phi_{\text{HeII}} = 4.0304$$

$$b_2 = 5.279e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1575.1 \text{ s}$$

$$\phi_{\text{CZ}} = 0.47567$$

$$d_0 = 4.7364e-05$$

$$d_2 = 3.8464e-08 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HI}} = 224.31 \text{ s}$$

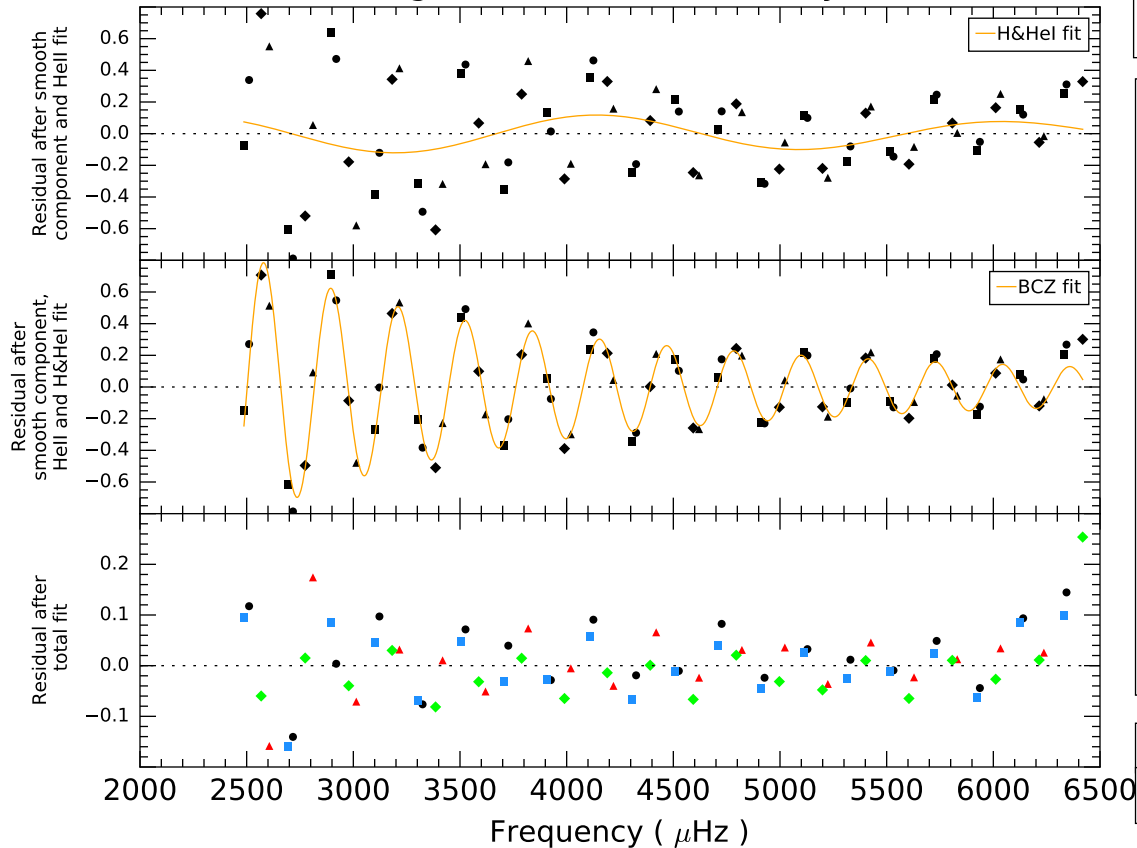
$$\phi_{\text{HI}} = 2.5628$$

profile8

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0052381$$



Age after ZAMS: 0.039 Gyr



$$a_0 = -8.6108 \mu \text{ Hz}$$

$$a_1 = 0.0034599$$

$$a_2 = -3.3191e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0013572$$

$$c_2 = 1.6155e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 429.64 \text{ s}$$

$$\phi_{\text{HeII}} = 3.8143$$

$$b_2 = 5.2258e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1587.9 \text{ s}$$

$$\phi_{\text{CZ}} = 0.33814$$

$$d_0 = 5.7796e-05$$

$$d_2 = 4.1357e-08 \mu\text{Hz}^{-2}$$

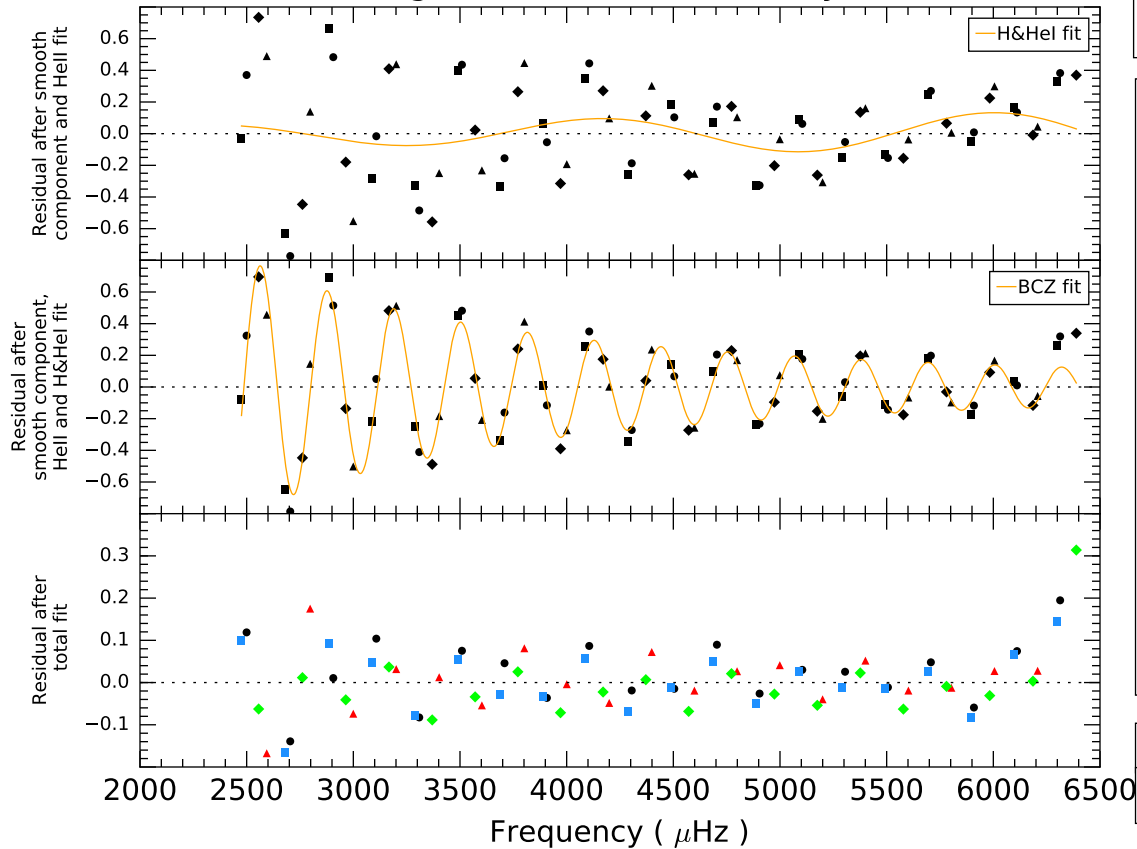
$$\tau_{\text{HI}} = 260.6 \text{ s}$$

$$\phi_{\text{HI}} = 0.54822$$

profile9

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0057765$$

# Age after ZAMS: 0.068 Gyr



- $\bullet$   $\ell = 0$
- $\blacktriangle$   $\ell = 1$
- $\blacksquare$   $\ell = 2$
- $\blacklozenge$   $\ell = 3$

$$a_0 = -8.9314 \mu \text{ Hz}$$

$$a_1 = 0.0036332$$

$$a_2 = -3.5338e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0012164$$

$$c_2 = 1.5565e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 434.99 \text{ s}$$

$$\phi_{\text{HeII}} = 3.7293$$

$$b_2 = 5.0312e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1597.4 \text{ s}$$

$$\phi_{\text{CZ}} = 0.34626$$

$$d_0 = 2.3765e-05$$

$$d_2 = 2.0251e-09 \mu\text{Hz}^{-2}$$

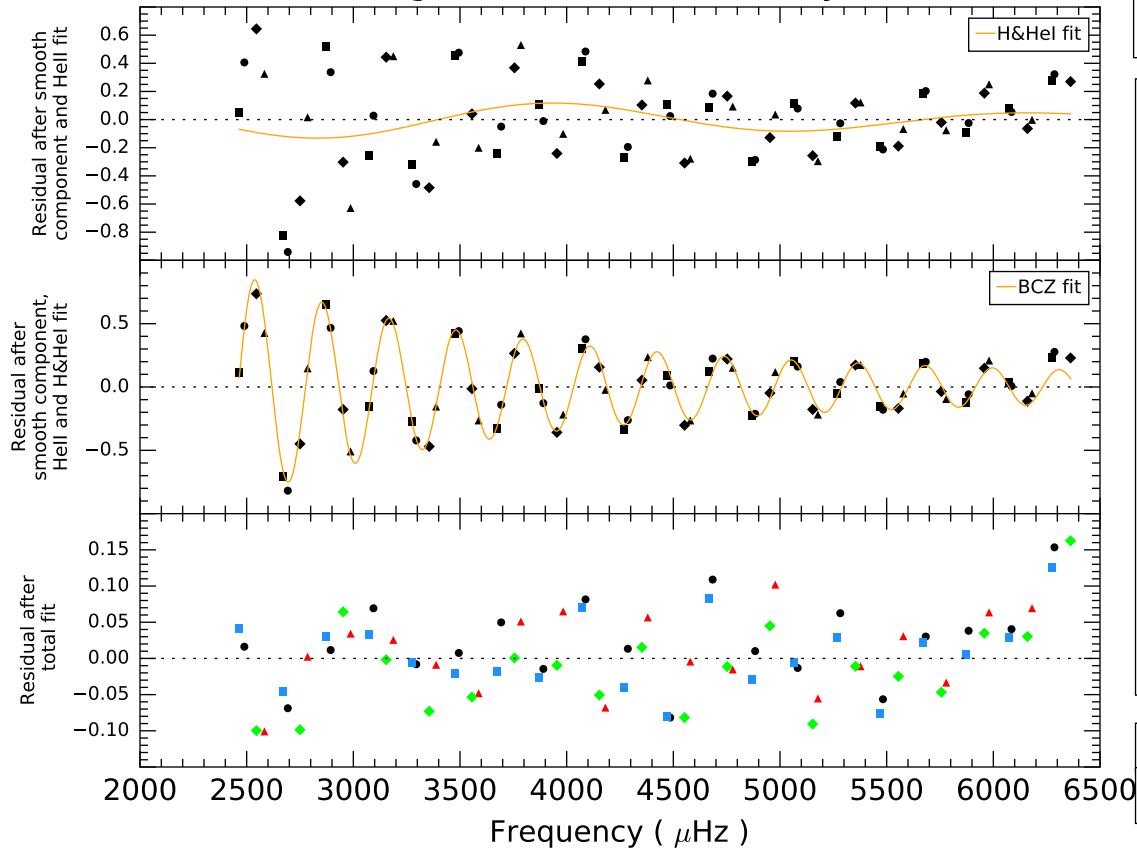
$$\tau_{\text{HI}} = 271.2 \text{ s}$$

$$\phi_{\text{HI}} = 0.001759$$

profile10

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0070879$$

# Age after ZAMS: 0.118 Gyr



$$a_0 = -8.702 \mu \text{ Hz}$$

$$a_1 = 0.0035184$$

$$a_2 = -3.3948e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0012753$$

$$c_2 = 1.5608e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 417.89 \text{ s}$$

$$\phi_{\text{HeII}} = 4.576$$

$$b_2 = 5.454e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1591.7 \text{ s}$$

$$\phi_{\text{CZ}} = 1.0387$$

$$d_0 = 7.4885e-05$$

$$d_2 = 5.9111e-08 \mu\text{Hz}^{-2}$$

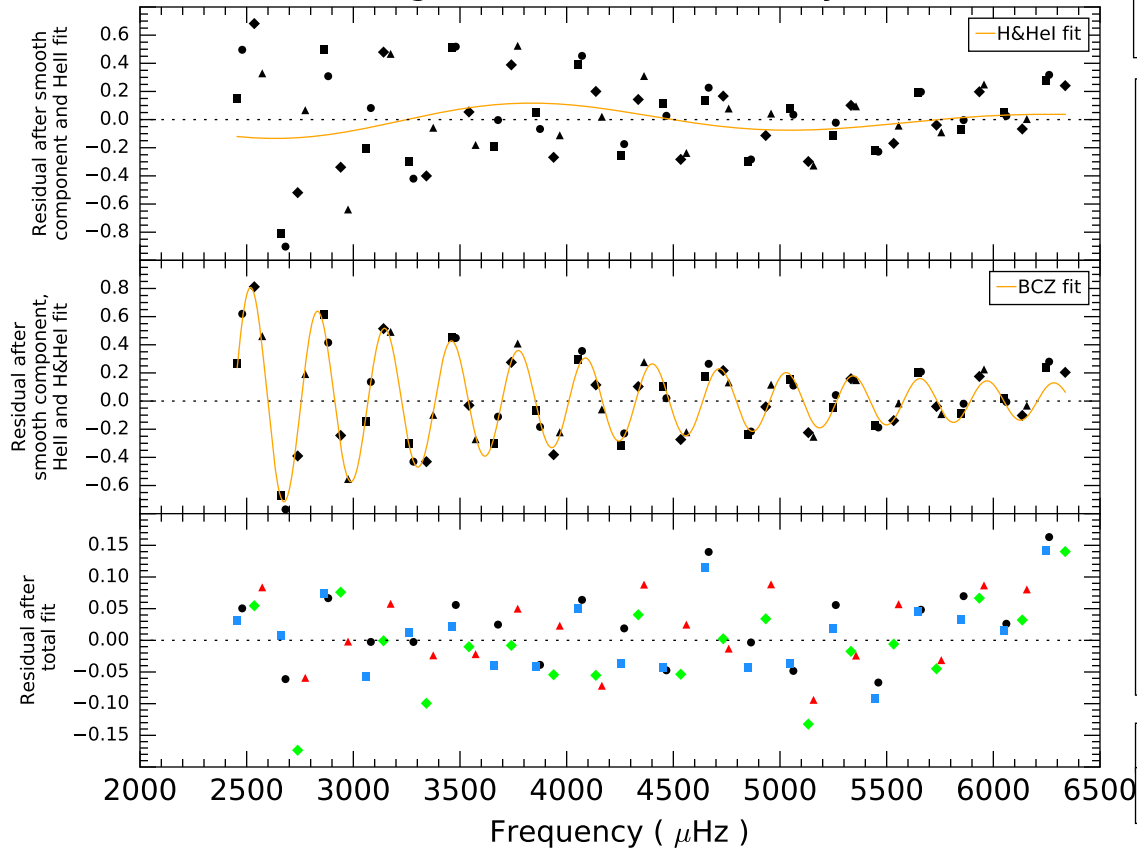
$$\tau_{\text{HI}} = 220.65 \text{ s}$$

$$\phi_{\text{HI}} = 3.1505$$

profile11

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0040336$$

# Age after ZAMS: 0.205 Gyr



- $\bullet$   $\ell=0$
- $\blacktriangle$   $\ell=1$
- $\blacksquare$   $\ell=2$
- $\blacklozenge$   $\ell=3$

$$a_0 = -8.8076 \mu \text{ Hz}$$

$$a_1 = 0.0035721$$

$$a_2 = -3.4575e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0012678$$

$$c_2 = 1.54e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 425.13 \text{ s}$$

$$\phi_{\text{HeII}} = 4.4117$$

$$b_2 = 5.123e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1593.8 \text{ s}$$

$$\phi_{\text{CZ}} = 1.3649$$

$$d_0 = 7.9943e-05$$

$$d_2 = 6.5092e-08 \mu\text{Hz}^{-2}$$

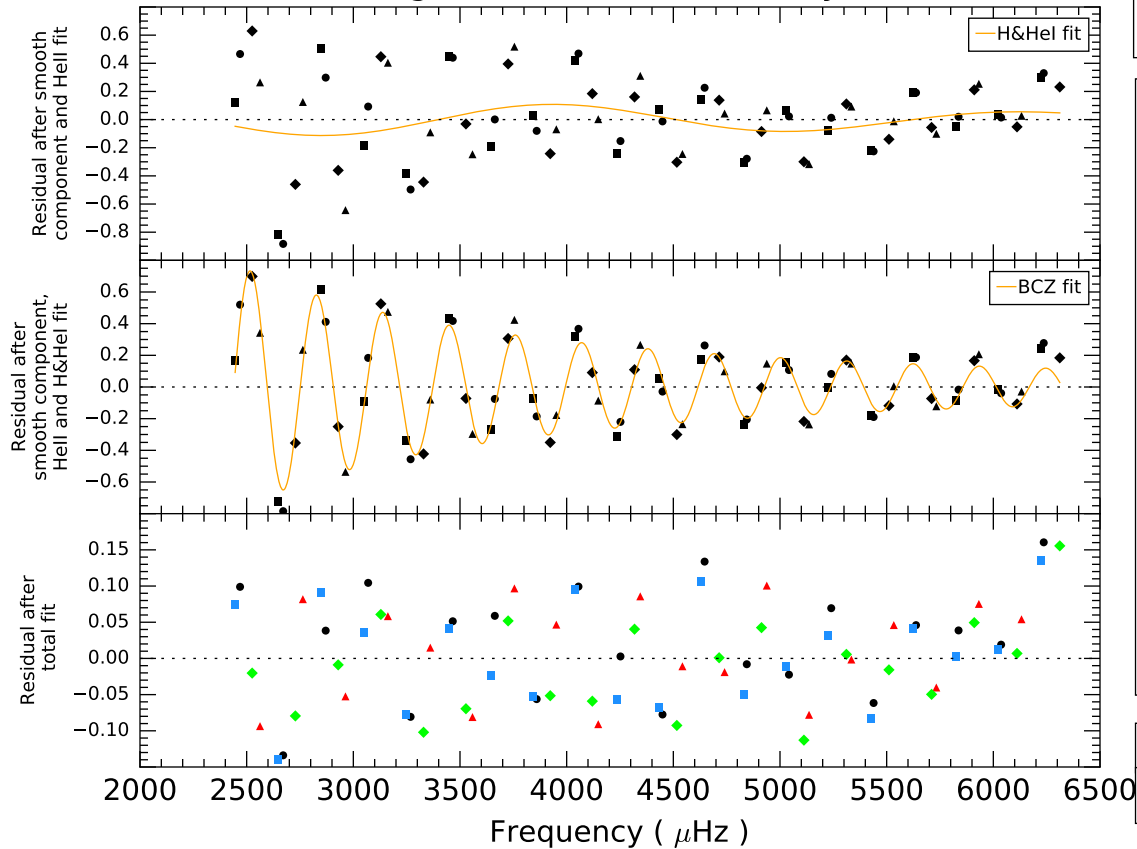
$$\tau_{\text{HI}} = 200.78 \text{ s}$$

$$\phi_{\text{HI}} = 4.3684$$

profile12

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0050356$$

# Age after ZAMS: 0.354 Gyr



$$a_0 = -8.6188 \mu \text{ Hz}$$

$$a_1 = 0.0035216$$

$$a_2 = -3.4325e-07 \mu\text{Hz}^{-1}$$

$$c_0 = 0.0012534$$

$$c_2 = 1.5757e-07 \mu\text{Hz}^{-2}$$

$$\tau_{HeII} = 427.64 \text{ s}$$

$$\phi_{HeII} = 4.3516$$

$$b_2 = 4.6453e+06 \text{ mHz}^3$$

$$\tau_{CZ} = 1609.3 \text{ s}$$

$$\phi_{CZ} = 0.91769$$

$$d_0 = 5.9673e-05$$

$$d_2 = 4.9956e-08 \mu\text{Hz}^{-2}$$

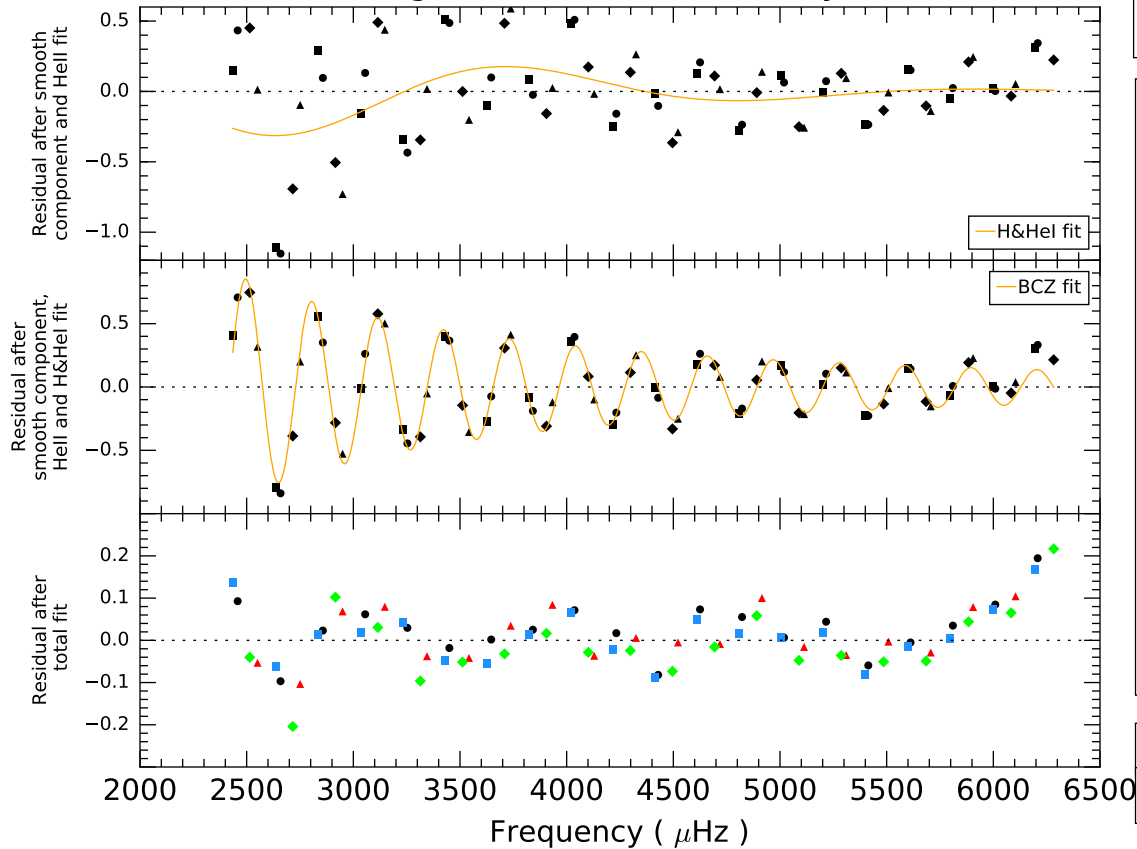
$$\tau_{HI} = 225.0 \text{ s}$$

$$\phi_{HI} = 2.9638$$

profile13

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0062561$$

Age after ZAMS: 0.610 Gyr



$$a_0 = -8.6206 \mu \text{ Hz}$$

$$a_1 = 0.003531$$

$$a_2 = -3.4532e-07 \mu\text{Hz}^{-1}$$

$$c_0 = 0.001472$$

$$c_2 = 1.6589e-07 \mu\text{Hz}^{-2}$$

$$\tau_{HeII} = 404.4 \text{ s}$$

$$\phi_{HeII} = 5.4773$$

$$b_2 = 5.3084e+06 \text{ mHz}^3$$

$$\tau_{CZ} = 1618.1 \text{ s}$$

$$\phi_{CZ} = 1.0645$$

$$d_0 = 0.00029612$$

$$d_2 = 1.303e-07 \mu\text{Hz}^{-2}$$

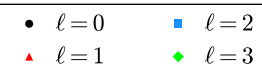
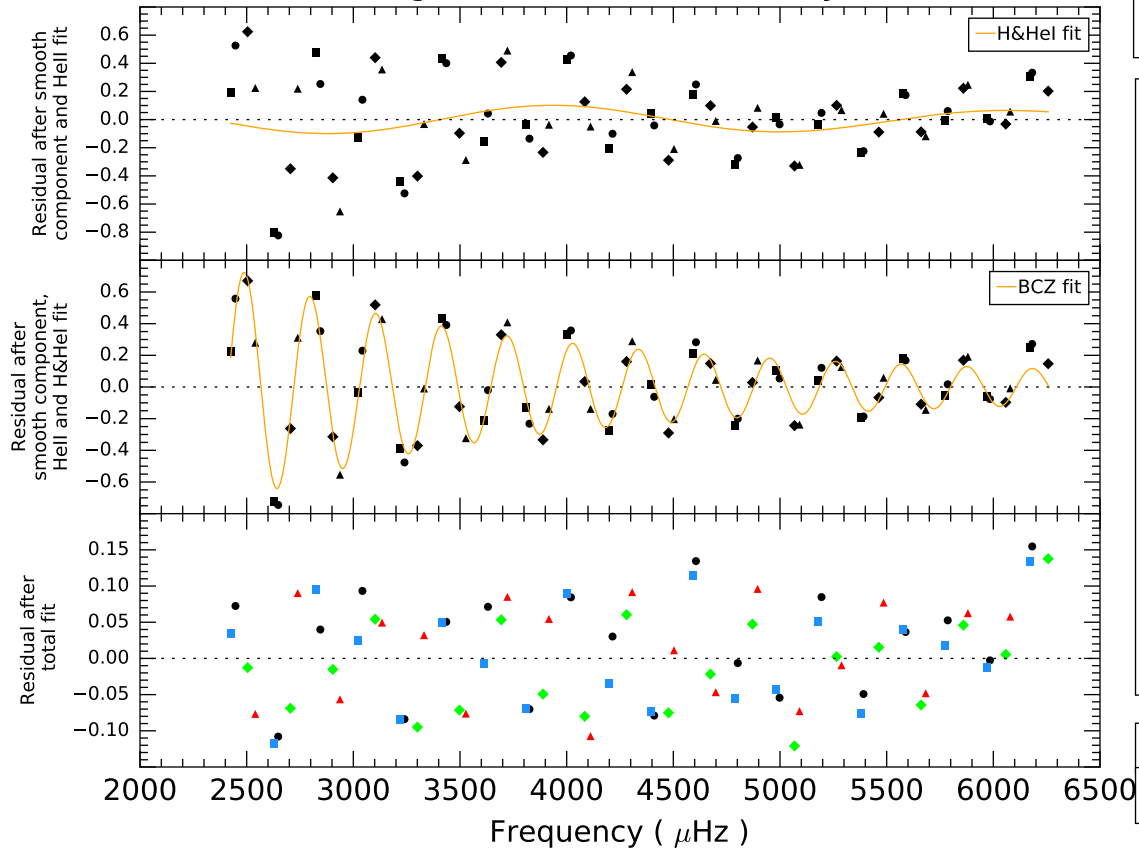
$$\tau_{HI} = 221.49 \text{ s}$$

$$\phi_{HI} = 3.5546$$

profile14

$$\chi^2_\nu(\text{dof} = 65) = 0.0059875$$

# Age after ZAMS: 0.910 Gyr

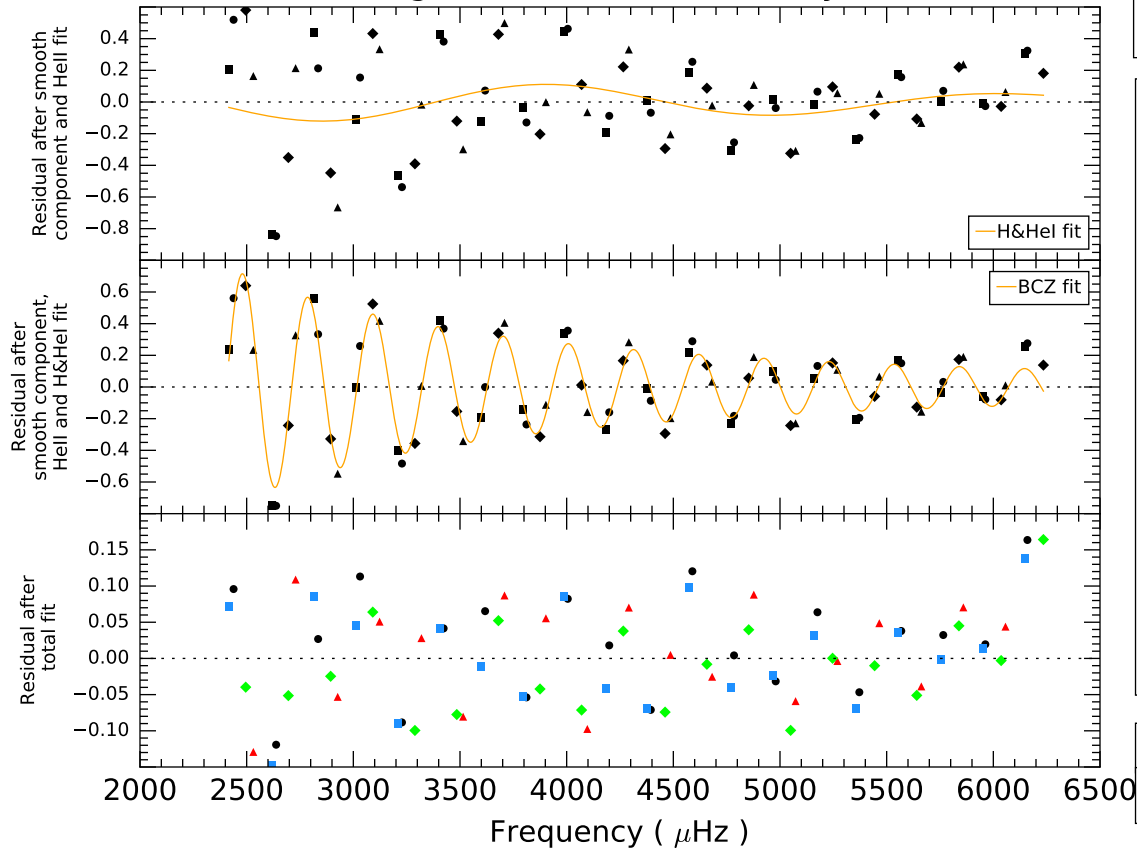


$a_0 = -8.5534 \mu \text{ Hz}$   
 $a_1 = 0.0035368$   
 $a_2 = -3.4874e-07 \mu\text{Hz}^{-1}$   
 $c_0 = 0.0012741$   
 $c_2 = 1.619e-07 \mu\text{Hz}^{-2}$   
 $\tau_{\text{HeII}} = 438.31 \text{ s}$   
 $\phi_{\text{HeII}} = 4.1175$   
 $b_2 = 4.4808e+06 \text{ mHz}^3$   
 $\tau_{\text{CZ}} = 1624.1 \text{ s}$   
 $\phi_{\text{CZ}} = 1.0195$   
 $d_0 = 4.8759e-05$   
 $d_2 = 4.0941e-08 \mu\text{Hz}^{-2}$   
 $\tau_{\text{HI}} = 231.99 \text{ s}$   
 $\phi_{\text{HI}} = 2.6387$

profile15

$\chi^2_{\nu}(\text{dof} = 65) = 0.0060763$

# Age after ZAMS: 1.210 Gyr



$$a_0 = -8.4332 \mu \text{ Hz}$$

$$a_1 = 0.0034979$$

$$a_2 = -3.4585e-07 \mu\text{Hz}^{-1}$$

$$c_0 = 0.0012934$$

$$c_2 = 1.6406e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 437.08 \text{ s}$$

$$\phi_{\text{HeII}} = 4.2477$$

$$b_2 = 4.4022e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1637.0 \text{ s}$$

$$\phi_{\text{CZ}} = 0.77738$$

$$d_0 = 6.6431e-05$$

$$d_2 = 5.533e-08 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HI}} = 232.97 \text{ s}$$

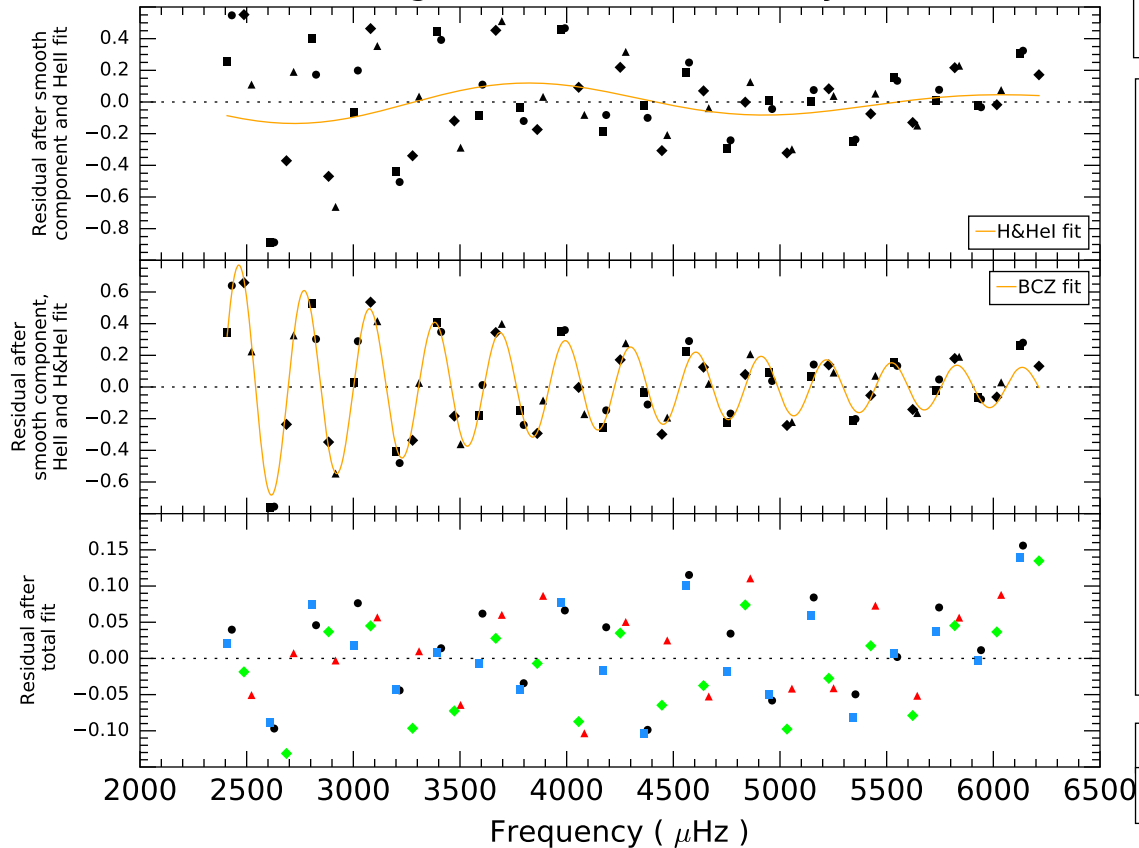
$$\phi_{\text{HI}} = 2.6514$$

profile16

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0060263$$



# Age after ZAMS: 1.510 Gyr



$$a_0 = -8.5465 \mu\text{Hz}$$

$$a_1 = 0.0035562$$

$$a_2 = -3.5276e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0013405$$

$$c_2 = 1.6684e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 432.49 \text{ s}$$

$$\phi_{\text{HeII}} = 4.5376$$

$$b_2 = 4.6759e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1634.4 \text{ s}$$

$$\phi_{\text{CZ}} = 1.2097$$

$$d_0 = 8.0067e-05$$

$$d_2 = 6.3925e-08 \mu\text{Hz}^{-2}$$

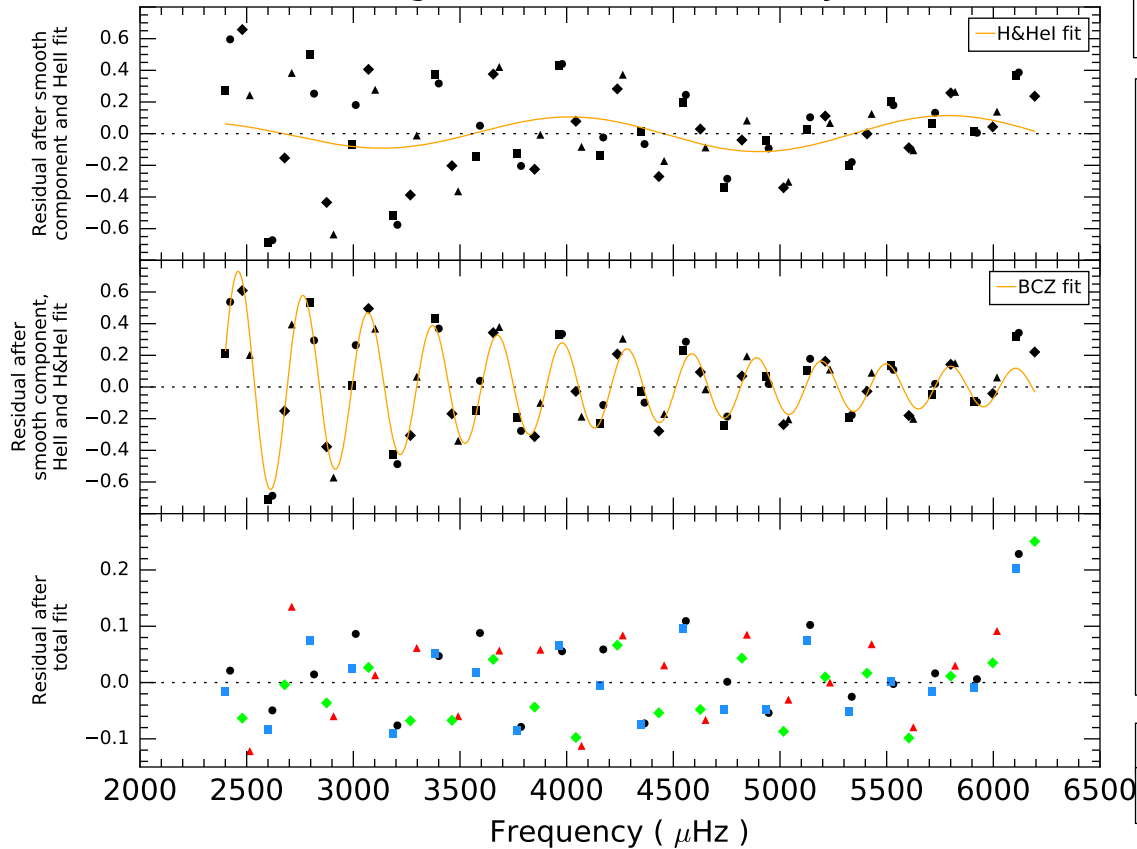
$$\tau_{\text{HI}} = 221.06 \text{ s}$$

$$\phi_{\text{HI}} = 3.4406$$

profile17

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0052969$$

# Age after ZAMS: 1.810 Gyr



$$a_0 = -8.6066 \mu \text{ Hz}$$

$$a_1 = 0.0036341$$

$$a_2 = -3.6629e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0013167$$

$$c_2 = 1.7141e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 458.16 \text{ s}$$

$$\phi_{\text{HeII}} = 3.5318$$

$$b_2 = 4.4225e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1646.8 \text{ s}$$

$$\phi_{\text{CZ}} = 0.88925$$

$$d_0 = 3.4495e-05$$

$$d_2 = 1.6574e-08 \mu\text{Hz}^{-2}$$

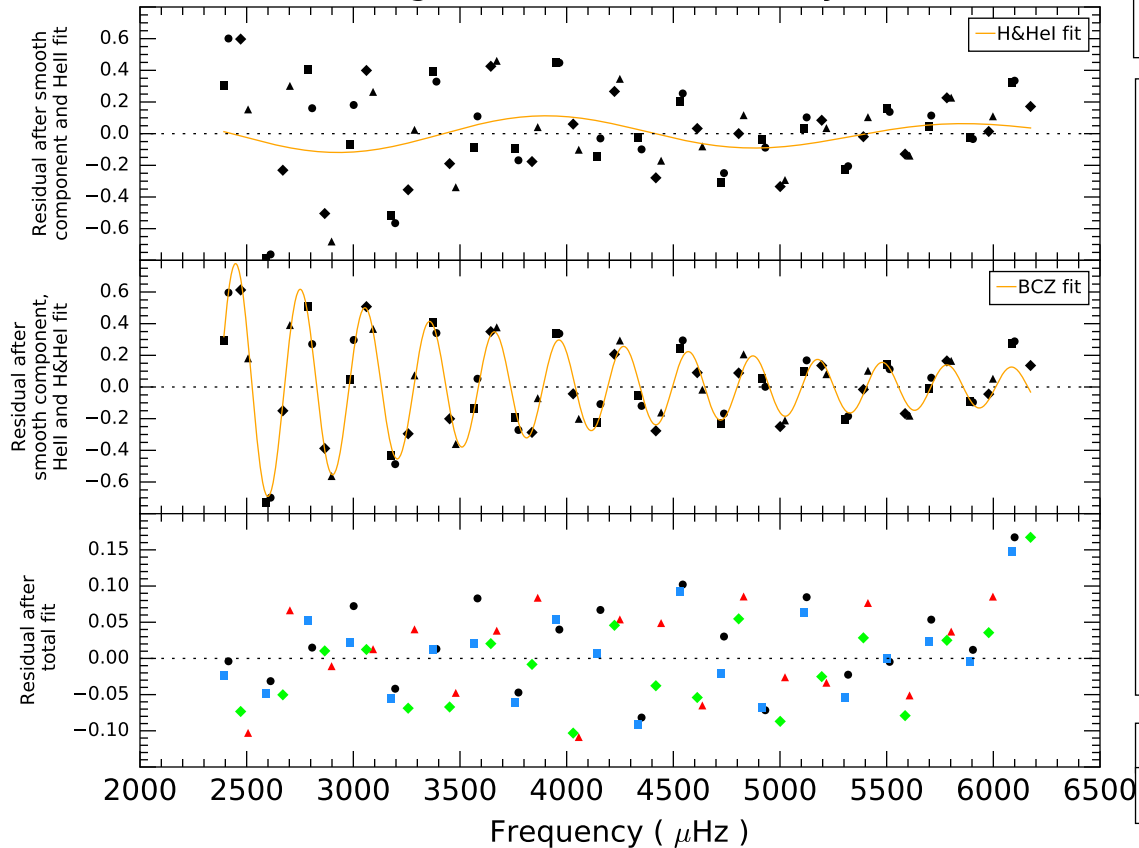
$$\tau_{\text{HI}} = 280.73 \text{ s}$$

$$\phi_{\text{HI}} = 0.0021335$$

profile18

$$\chi^2_{\nu}(\text{dof} = 65) = 0.006987$$

# Age after ZAMS: 2.110 Gyr



$$a_0 = -8.3878 \mu\text{Hz}$$

$$a_1 = 0.0035323$$

$$a_2 = -3.5456e-07 \mu\text{Hz}^{-1}$$

$$c_0 = 0.0013893$$

$$c_2 = 1.7368e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 448.97 \text{ s}$$

$$\phi_{\text{HeII}} = 3.9874$$

$$b_2 = 4.674e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1650.0 \text{ s}$$

$$\phi_{\text{CZ}} = 1.0432$$

$$d_0 = 6.2913e-05$$

$$d_2 = 5.1014e-08 \mu\text{Hz}^{-2}$$

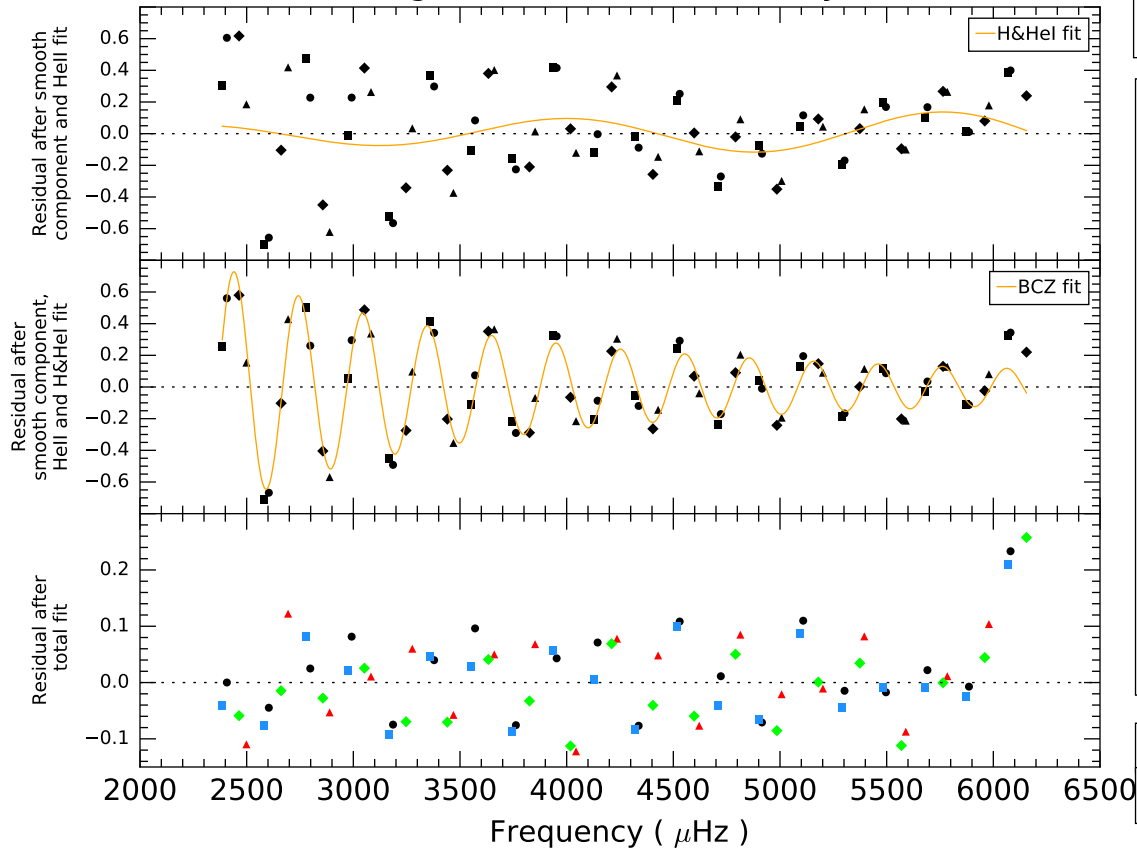
$$\tau_{\text{HI}} = 252.03 \text{ s}$$

$$\phi_{\text{HI}} = 1.7323$$

profile19

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0047914$$

# Age after ZAMS: 2.410 Gyr



$$a_0 = -8.6888 \mu\text{Hz}$$

$$a_1 = 0.0037065$$

$$a_2 = -3.7749e-07 \mu\text{Hz}^{-1}$$

$$c_0 = 0.0012528$$

$$c_2 = 1.6825e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 462.35 \text{ s}$$

$$\phi_{\text{HeII}} = 3.5343$$

$$b_2 = 4.3383e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1656.6 \text{ s}$$

$$\phi_{\text{CZ}} = 1.0001$$

$$d_0 = 2.4355e-05$$

$$d_2 = 6.782e-10 \mu\text{Hz}^{-2}$$

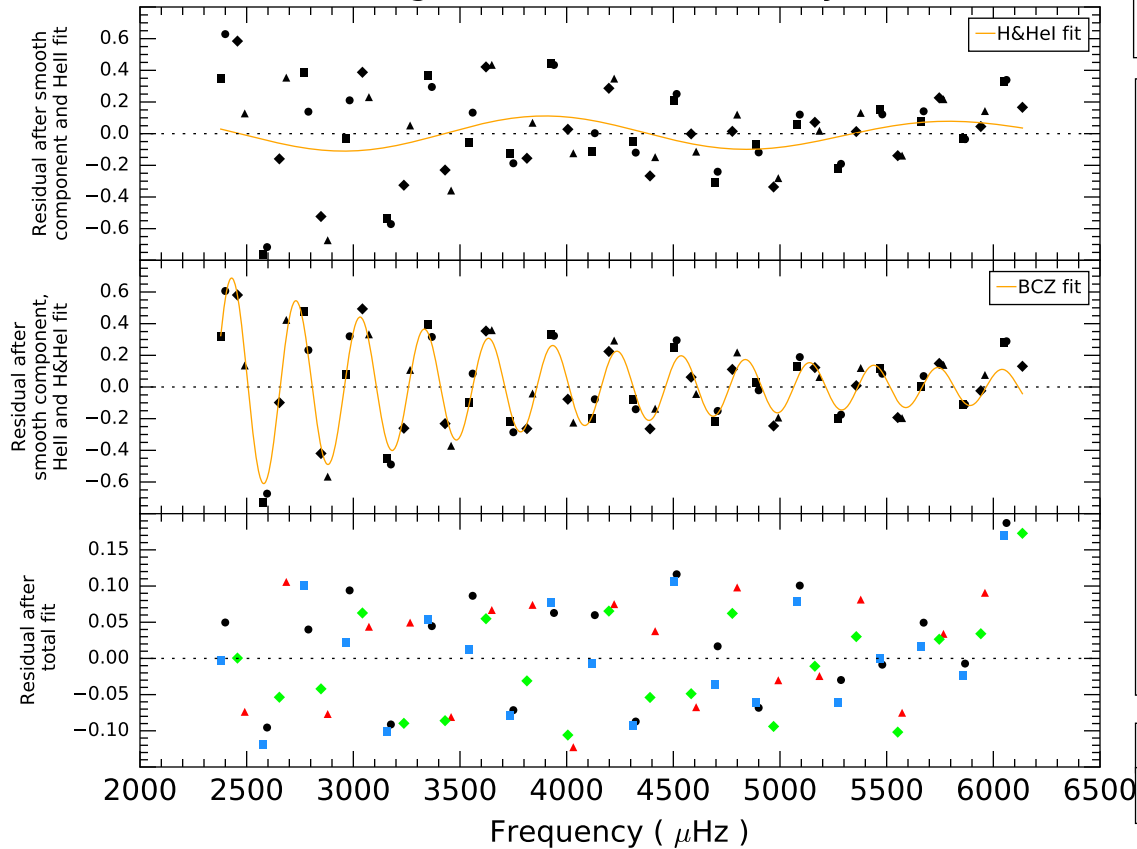
$$\tau_{\text{HI}} = 282.61 \text{ s}$$

$$\phi_{\text{HI}} = 0.00062977$$

profile20

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0074021$$

# Age after ZAMS: 2.710 Gyr



- $\bullet$   $\ell = 0$
- $\blacktriangle$   $\ell = 1$
- $\blacksquare$   $\ell = 2$
- $\blacklozenge$   $\ell = 3$

$$a_0 = -8.3908 \mu \text{ Hz}$$

$$a_1 = 0.0035679$$

$$a_2 = -3.6159e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0014014$$

$$c_2 = 1.7704e-07 \mu\text{Hz}^{-2}$$

$$\tau_{HeII} = 455.72 \text{ s}$$

$$\phi_{HeII} = 3.8658$$

$$b_2 = 4.0653e+06 \text{ mHz}^3$$

$$\tau_{CZ} = 1661.8 \text{ s}$$

$$\phi_{CZ} = 1.0647$$

$$d_0 = 5.3261e-05$$

$$d_2 = 4.0719e-08 \mu\text{Hz}^{-2}$$

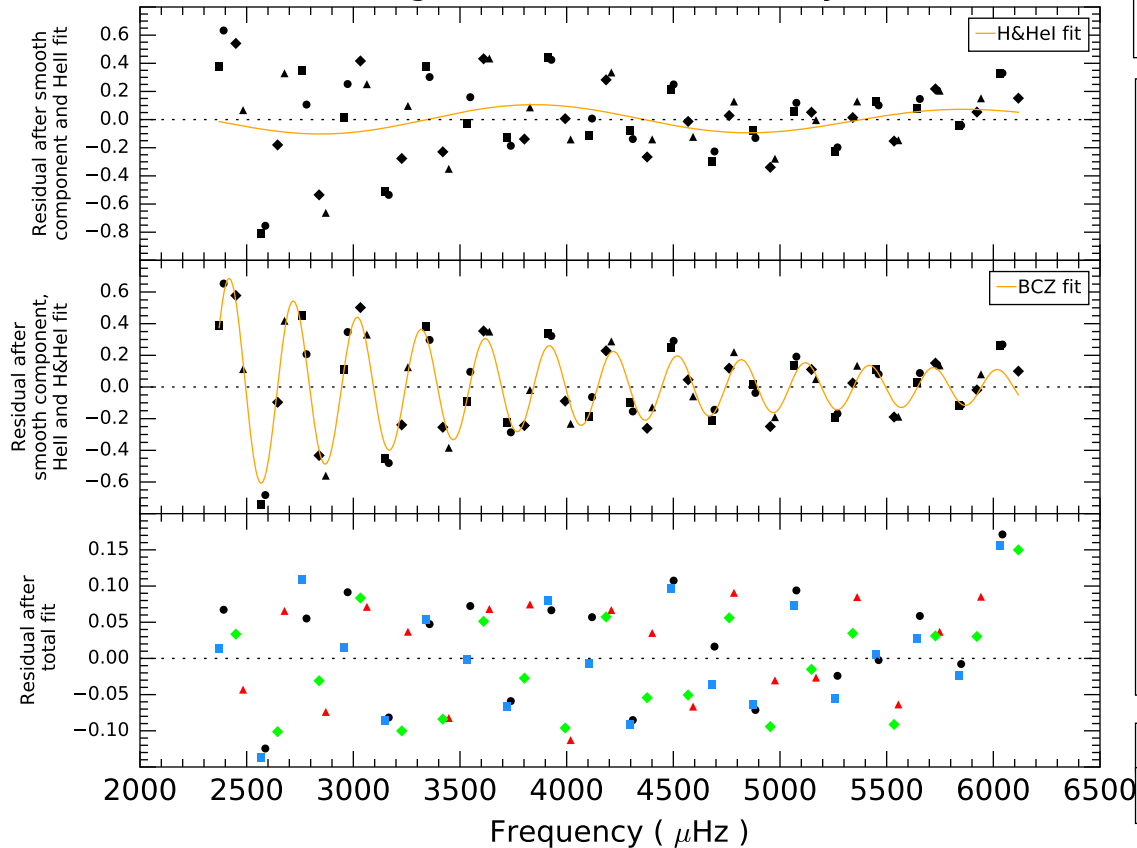
$$\tau_{HI} = 261.09 \text{ s}$$

$$\phi_{HI} = 1.3286$$

profile21

$$\chi^2_{\nu}(\text{dof} = 65) = 0.006911$$

# Age after ZAMS: 3.010 Gyr



$$a_0 = -8.465 \mu \text{ Hz}$$

$$a_1 = 0.00361$$

$$a_2 = -3.6684e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0014018$$

$$c_2 = 1.7692e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 452.99 \text{ s}$$

$$\phi_{\text{HeII}} = 4.0807$$

$$b_2 = 4.009e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1666.9 \text{ s}$$

$$\phi_{\text{CZ}} = 1.148$$

$$d_0 = 4.9937e-05$$

$$d_2 = 4.0143e-08 \mu\text{Hz}^{-2}$$

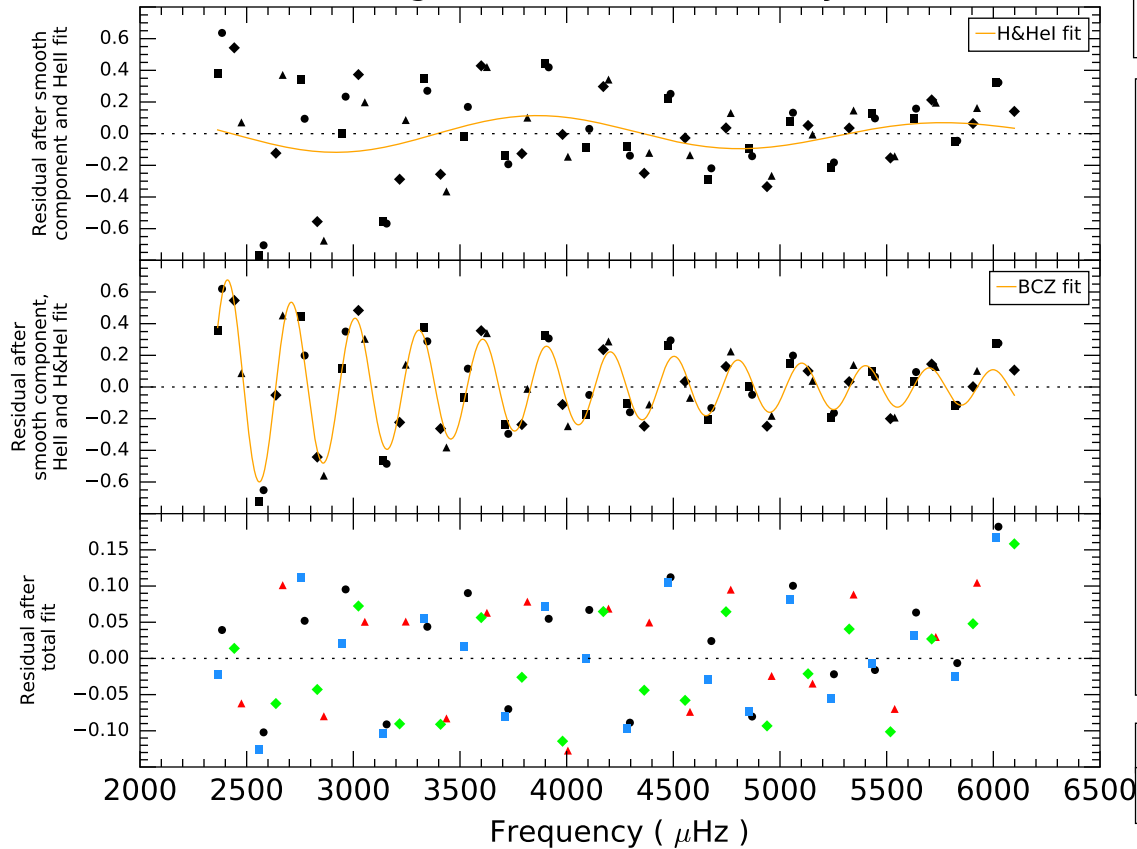
$$\tau_{\text{HI}} = 245.21 \text{ s}$$

$$\phi_{\text{HI}} = 2.2674$$

profile22

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0065234$$

# Age after ZAMS: 3.310 Gyr



- $\bullet$   $\ell = 0$
- $\blacktriangle$   $\ell = 1$
- $\blacksquare$   $\ell = 2$
- $\blacklozenge$   $\ell = 3$

$$a_0 = -8.3032 \mu \text{ Hz}$$

$$a_1 = 0.0035561$$

$$a_2 = -3.628e-07 \mu\text{Hz}^{-1}$$

$$c_0 = 0.0014105$$

$$c_2 = 1.7896e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 459.45 \text{ s}$$

$$\phi_{\text{HeII}} = 3.8726$$

$$b_2 = 3.9318e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1672.4 \text{ s}$$

$$\phi_{\text{CZ}} = 1.1475$$

$$d_0 = 6.113e-05$$

$$d_2 = 4.8663e-08 \mu\text{Hz}^{-2}$$

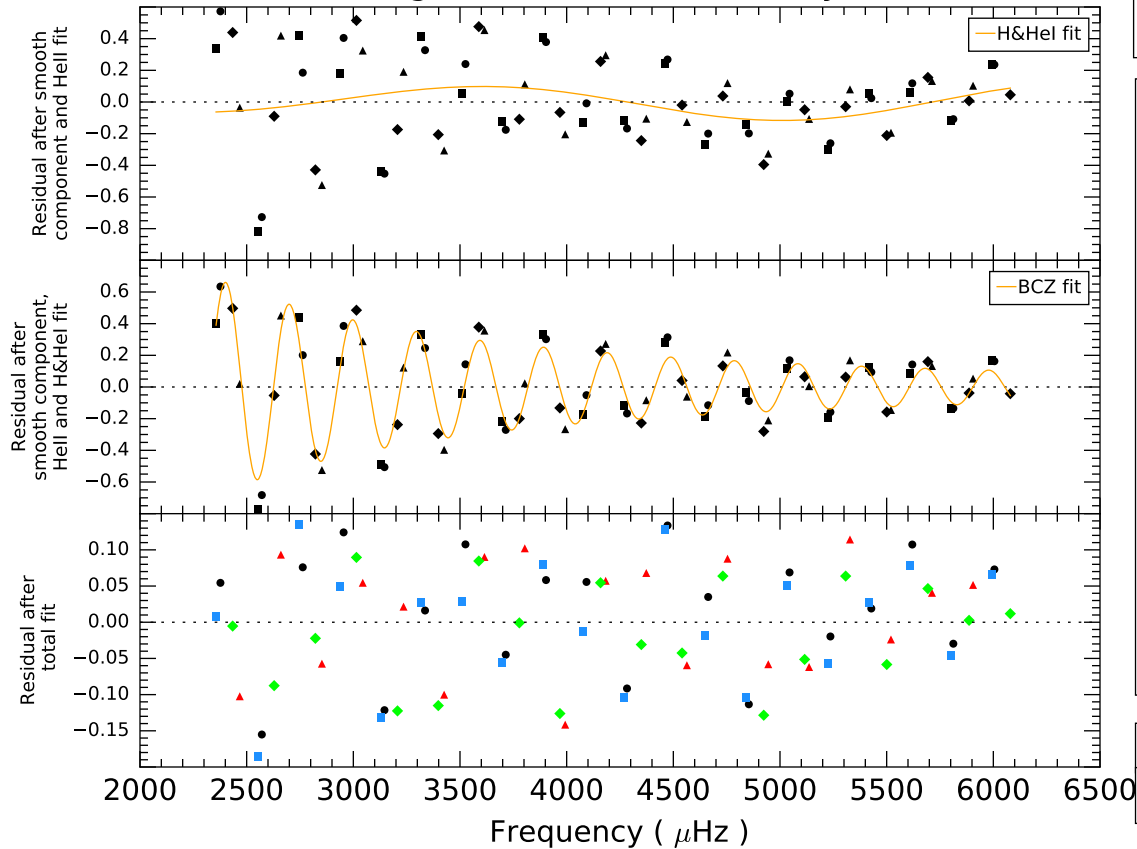
$$\tau_{\text{HI}} = 259.77 \text{ s}$$

$$\phi_{\text{HI}} = 1.4913$$

profile23

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0071637$$

# Age after ZAMS: 3.610 Gyr



$$a_0 = -8.7426 \mu \text{ Hz}$$

$$a_1 = 0.0037254$$

$$a_2 = -3.7714e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0010901$$

$$c_2 = 1.5494e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 450.04 \text{ s}$$

$$\phi_{\text{HeII}} = 4.3855$$

$$b_2 = 3.8106e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1677.6 \text{ s}$$

$$\phi_{\text{CZ}} = 1.1889$$

$$d_0 = 3.2376e-05$$

$$d_2 = 1.3103e-08 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HI}} = 174.91 \text{ s}$$

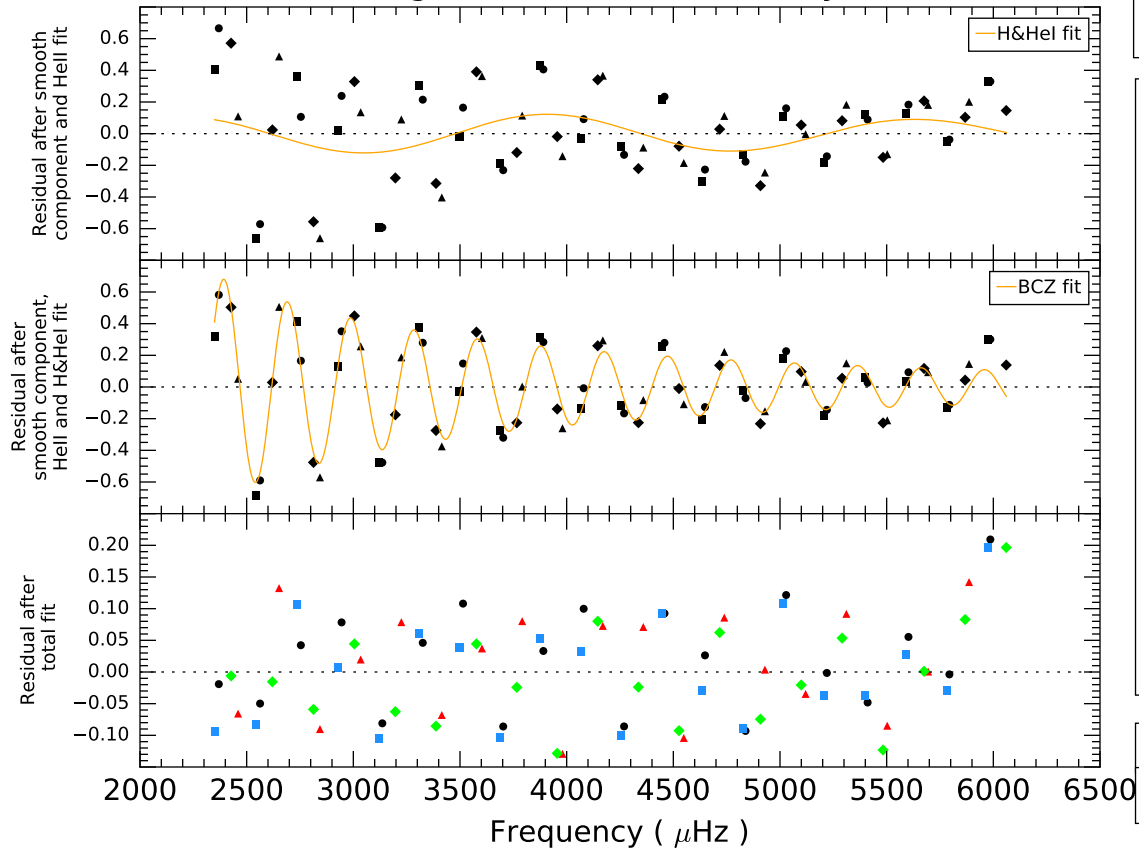
$$\phi_{\text{HI}} = 0.012789$$

profile24

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0078922$$



# Age after ZAMS: 3.910 Gyr



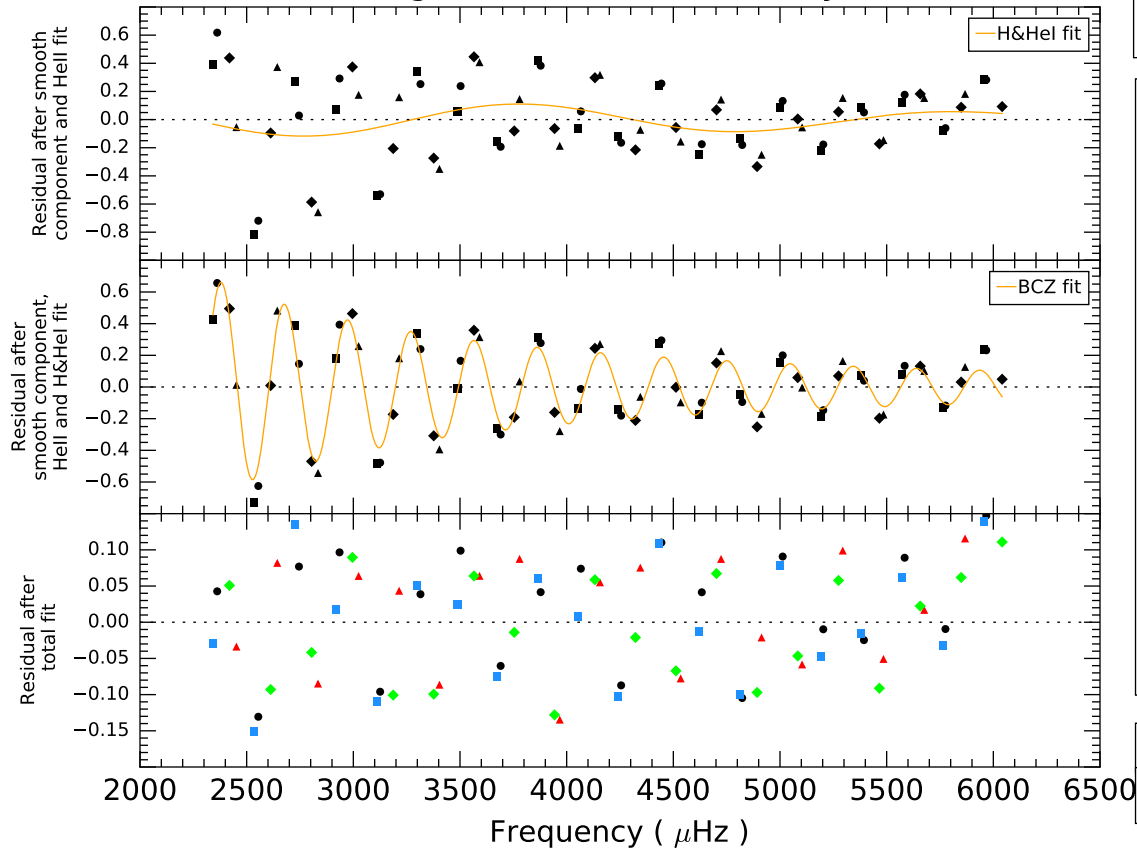
- $\bullet$   $\ell=0$
- $\blacktriangle$   $\ell=1$
- $\blacksquare$   $\ell=2$
- $\blacklozenge$   $\ell=3$

$$\begin{aligned}
 a_0 &= -8.2393 \mu \text{ Hz} \\
 a_1 &= 0.0035684 \\
 a_2 &= -3.6816e-07 \mu \text{ Hz}^{-2} \\
 c_0 &= 0.0014118 \\
 c_2 &= 1.8365e-07 \mu \text{ Hz}^{-2} \\
 \tau_{\text{HeII}} &= 477.1 \text{ s} \\
 \phi_{\text{HeII}} &= 3.3104 \\
 b_2 &= 3.8975e+06 \text{ mHz}^3 \\
 \tau_{\text{CZ}} &= 1683.1 \text{ s} \\
 \phi_{\text{CZ}} &= 1.197 \\
 d_0 &= 5.8243e-05 \\
 d_2 &= 4.0543e-08 \mu \text{ Hz}^{-2} \\
 \tau_{\text{HI}} &= 287.52 \text{ s} \\
 \phi_{\text{HI}} &= 0.00084882
 \end{aligned}$$

profile25

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0082348$$

# Age after ZAMS: 4.210 Gyr



- $\bullet$   $\ell = 0$
- $\blacktriangle$   $\ell = 1$
- $\blacksquare$   $\ell = 2$
- $\blacklozenge$   $\ell = 3$

$$a_0 = -8.2308 \mu \text{ Hz}$$

$$a_1 = 0.0035581$$

$$a_2 = -3.6607e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0013618$$

$$c_2 = 1.7641e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 461.22 \text{ s}$$

$$\phi_{\text{HeII}} = 4.0578$$

$$b_2 = 3.7446e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1687.6 \text{ s}$$

$$\phi_{\text{CZ}} = 1.333$$

$$d_0 = 6.5176e-05$$

$$d_2 = 5.5928e-08 \mu\text{Hz}^{-2}$$

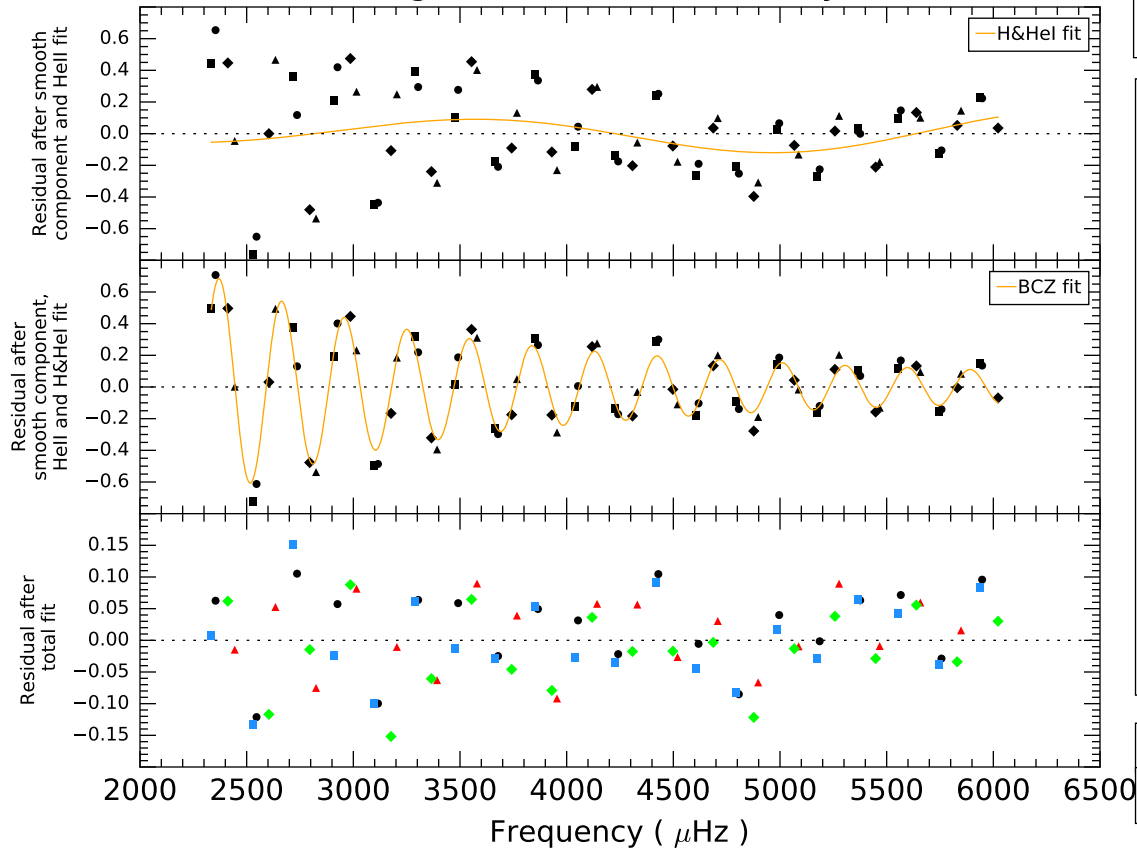
$$\tau_{\text{HI}} = 242.33 \text{ s}$$

$$\phi_{\text{HI}} = 2.585$$

profile26

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0075966$$

# Age after ZAMS: 4.510 Gyr



- $\bullet$   $\ell=0$
- $\blacktriangle$   $\ell=1$
- $\blacksquare$   $\ell=2$
- $\blacklozenge$   $\ell=3$

$$a_0 = -8.76 \mu \text{ Hz}$$

$$a_1 = 0.0037873$$

$$a_2 = -3.889e-07 \mu\text{Hz}^{-1}$$

$$c_0 = 0.0011649$$

$$c_2 = 1.6129e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 461.38 \text{ s}$$

$$\phi_{\text{HeII}} = 4.1772$$

$$b_2 = 3.8466e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1704.6 \text{ s}$$

$$\phi_{\text{CZ}} = 1.0285$$

$$d_0 = 2.7157e-05$$

$$d_2 = 4.482e-09 \mu\text{Hz}^{-2}$$

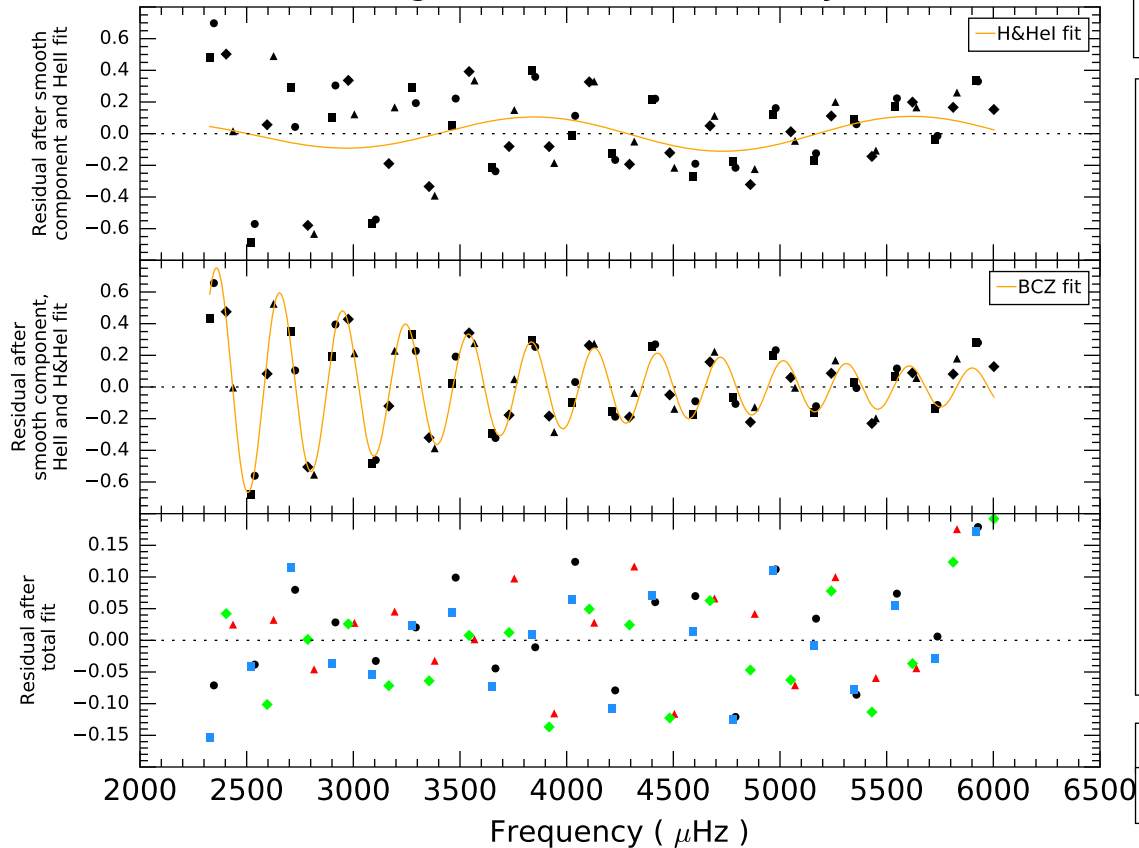
$$\tau_{\text{HI}} = 177.23 \text{ s}$$

$$\phi_{\text{HI}} = 0.010169$$

profile27

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0052035$$

# Age after ZAMS: 4.810 Gyr



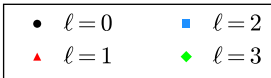
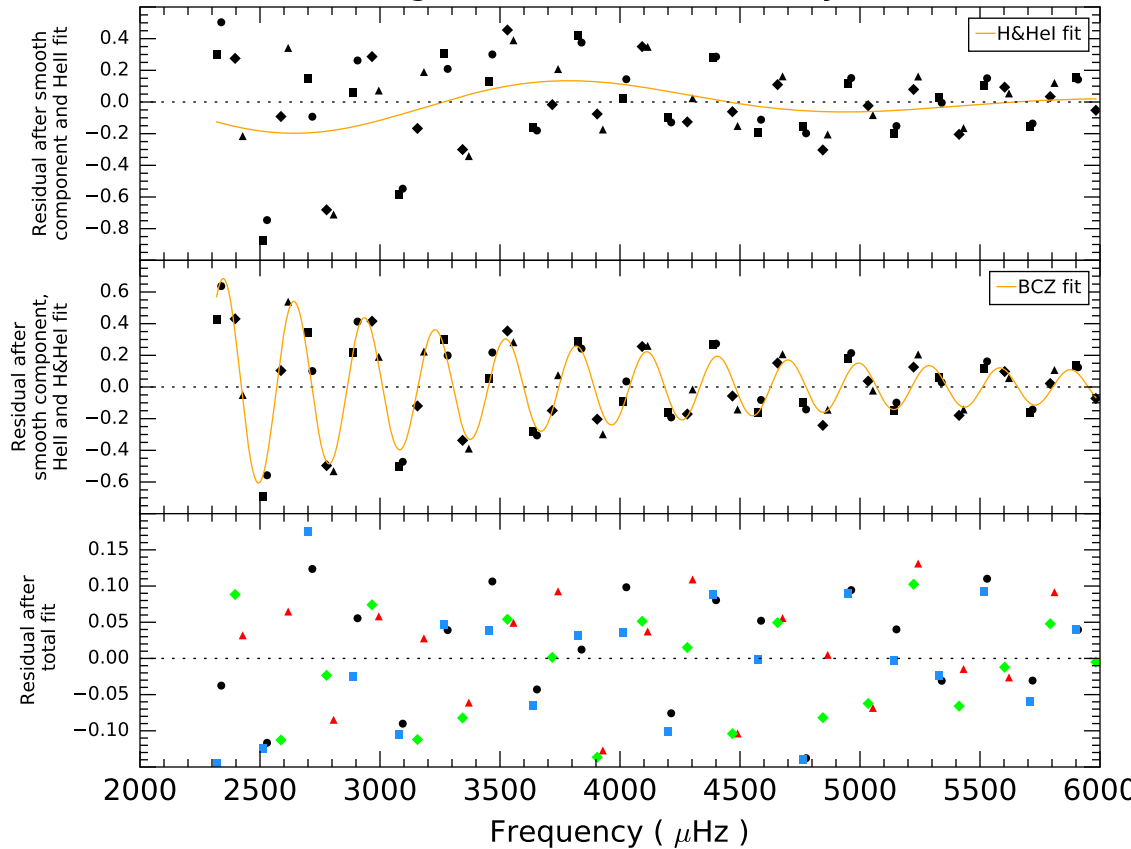
- $\bullet$   $\ell=0$
- $\blacktriangle$   $\ell=1$
- $\blacksquare$   $\ell=2$
- $\blacklozenge$   $\ell=3$

$$\begin{aligned}
 a_0 &= -8.423 \mu \text{ Hz} \\
 a_1 &= 0.0037034 \\
 a_2 &= -3.88e-07 \mu\text{Hz}^{-1} \\
 c_0 &= 0.0013828 \\
 c_2 &= 1.8245e-07 \mu\text{Hz}^{-2} \\
 \tau_{\text{HeII}} &= 478.36 \text{ s} \\
 \phi_{\text{HeII}} &= 3.5374 \\
 b_2 &= 4.1875e+06 \text{ mHz}^3 \\
 \tau_{\text{CZ}} &= 1694.2 \text{ s} \\
 \phi_{\text{CZ}} &= 1.5843 \\
 d_0 &= 3.7056e-05 \\
 d_2 &= 2.0343e-08 \mu\text{Hz}^{-2} \\
 \tau_{\text{HI}} &= 280.65 \text{ s} \\
 \phi_{\text{HI}} &= 0.59512
 \end{aligned}$$

profile28

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0080889$$

# Age after ZAMS: 5.110 Gyr



$$\begin{aligned}
 a_0 &= -7.2571 \mu \text{ Hz} \\
 a_1 &= 0.0031243 \\
 a_2 &= -3.1889e-07 \mu\text{Hz}^{-2}
 \end{aligned}$$

$$\begin{aligned}
 c_0 &= 0.0013495 \\
 c_2 &= 1.7717e-07 \mu\text{Hz}^{-2} \\
 \tau_{\text{HeII}} &= 471.51 \text{ s} \\
 \phi_{\text{HeII}} &= 3.8864
 \end{aligned}$$

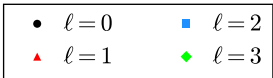
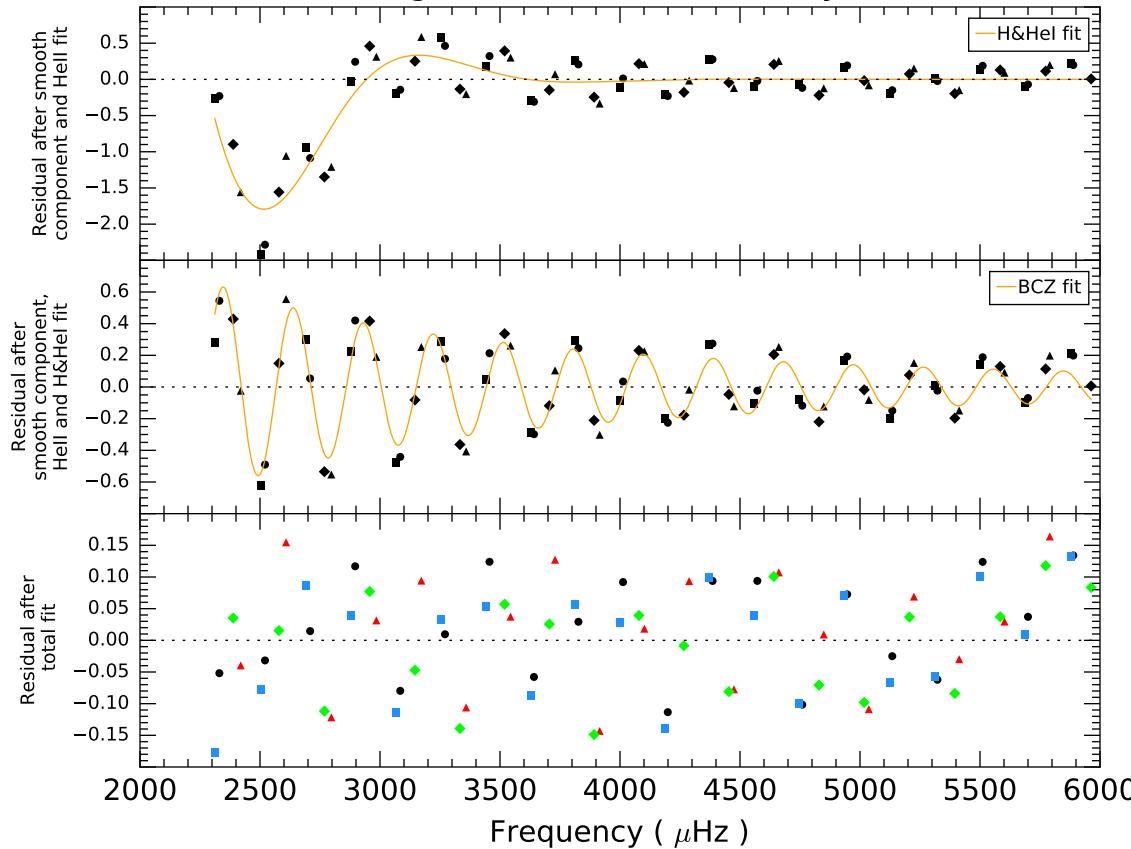
$$\begin{aligned}
 b_2 &= 3.7719e+06 \text{ mHz}^3 \\
 \tau_{\text{CZ}} &= 1700.4 \text{ s} \\
 \phi_{\text{CZ}} &= 1.6573
 \end{aligned}$$

$$\begin{aligned}
 d_0 &= 0.00014991 \\
 d_2 &= 9.9348e-08 \mu\text{Hz}^{-2} \\
 \tau_{\text{HI}} &= 209.75 \text{ s} \\
 \phi_{\text{HI}} &= 3.9766
 \end{aligned}$$

profile29

$$\chi^2_\nu(\text{dof} = 65) = 0.0075622$$

Age after ZAMS: 5.410 Gyr



$$\begin{aligned} a_0 &= -6.6133 \mu \text{ Hz} \\ a_1 &= 0.0029115 \\ a_2 &= -3.0317e-07 \mu \text{ Hz}^{-2} \end{aligned}$$

$$\begin{aligned} c_0 &= 0.0032553 \\ c_2 &= 2.2003e-07 \mu \text{ Hz}^{-2} \\ \tau_{\text{HeII}} &= 421.02 \text{ s} \\ \phi_{\text{HeII}} &= 6.2823 \end{aligned}$$

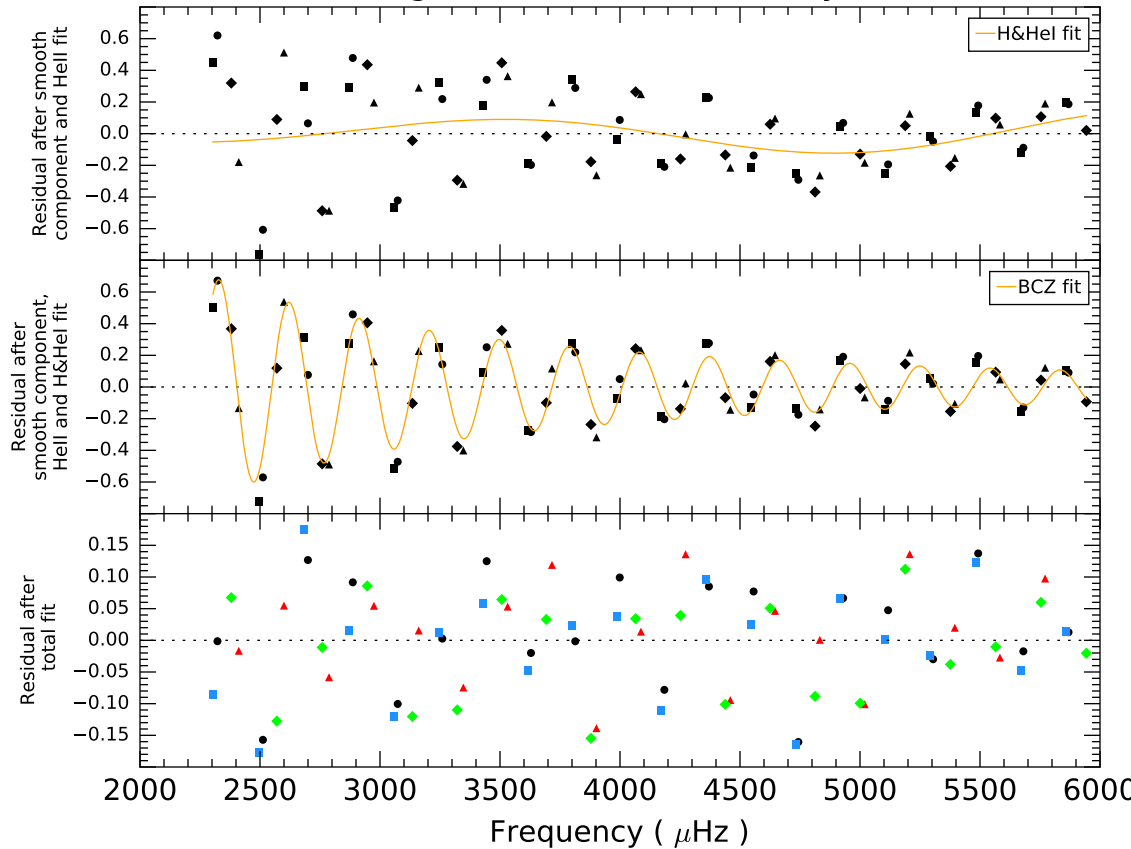
$$\begin{aligned} b_2 &= 3.4801e+06 \text{ mHz}^3 \\ \tau_{\text{CZ}} &= 1714.3 \text{ s} \\ \phi_{\text{CZ}} &= 1.2532 \end{aligned}$$

$$\begin{aligned} d_0 &= 0.01898 \\ d_2 &= 5.0321e-07 \mu \text{ Hz}^{-2} \\ \tau_{\text{HI}} &= 372.34 \text{ s} \\ \phi_{\text{HI}} &= 5.0753 \end{aligned}$$

profile30

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0091689$$

# Age after ZAMS: 5.710 Gyr



$$a_0 = -8.692 \mu \text{ Hz}$$

$$a_1 = 0.0038252$$

$$a_2 = -3.9955e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0011374$$

$$c_2 = 1.6354e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 466.45 \text{ s}$$

$$\phi_{\text{HeII}} = 4.3015$$

$$b_2 = 3.6752e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1712.3 \text{ s}$$

$$\phi_{\text{CZ}} = 1.7034$$

$$d_0 = 2.6474e-05$$

$$d_2 = 1.9027e-09 \mu\text{Hz}^{-2}$$

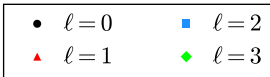
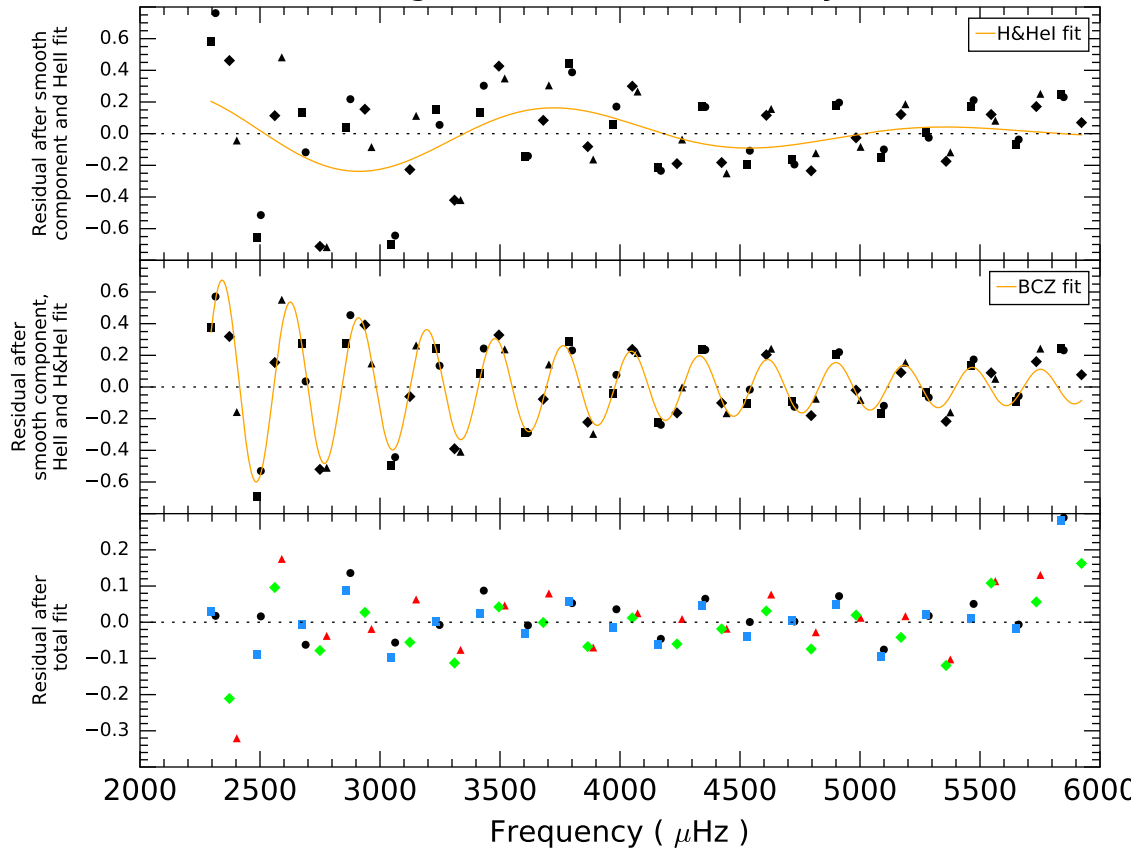
$$\tau_{\text{HI}} = 179.8 \text{ s}$$

$$\phi_{\text{HI}} = 0.02311$$

profile31

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0088698$$

# Age after ZAMS: 6.010 Gyr



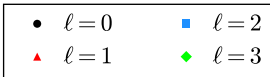
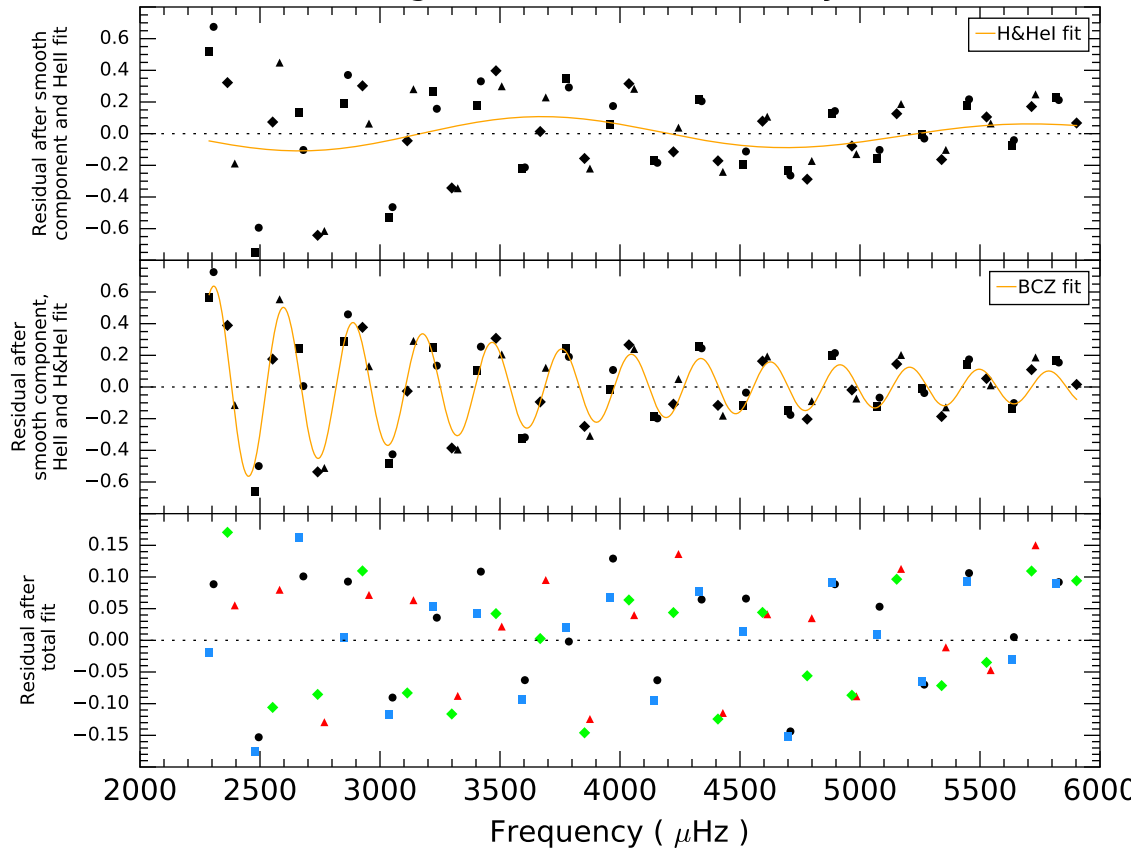
$a_0 = -7.652 \mu \text{ Hz}$   
 $a_1 = 0.0034018$   
 $a_2 = -3.5931e-07 \mu\text{Hz}^{-2}$   
 $c_0 = 0.0019124$   
 $c_2 = 2.2277e-07 \mu\text{Hz}^{-2}$   
 $\tau_{\text{HeII}} = 482.04 \text{ s}$   
 $\phi_{\text{HeII}} = 3.6114$   
 $b_2 = 3.7047e+06 \text{ mHz}^3$   
 $\tau_{\text{CZ}} = 1760.2 \text{ s}$   
 $\phi_{\text{CZ}} = 6.274$   
 $d_0 = 0.00021658$   
 $d_2 = 1.1435e-07 \mu\text{Hz}^{-2}$   
 $\tau_{\text{HI}} = 301.34 \text{ s}$   
 $\phi_{\text{HI}} = 6.1658$

profile32

$\chi^2_{\nu}(\text{dof} = 65) = 0.0096789$



# Age after ZAMS: 6.310 Gyr

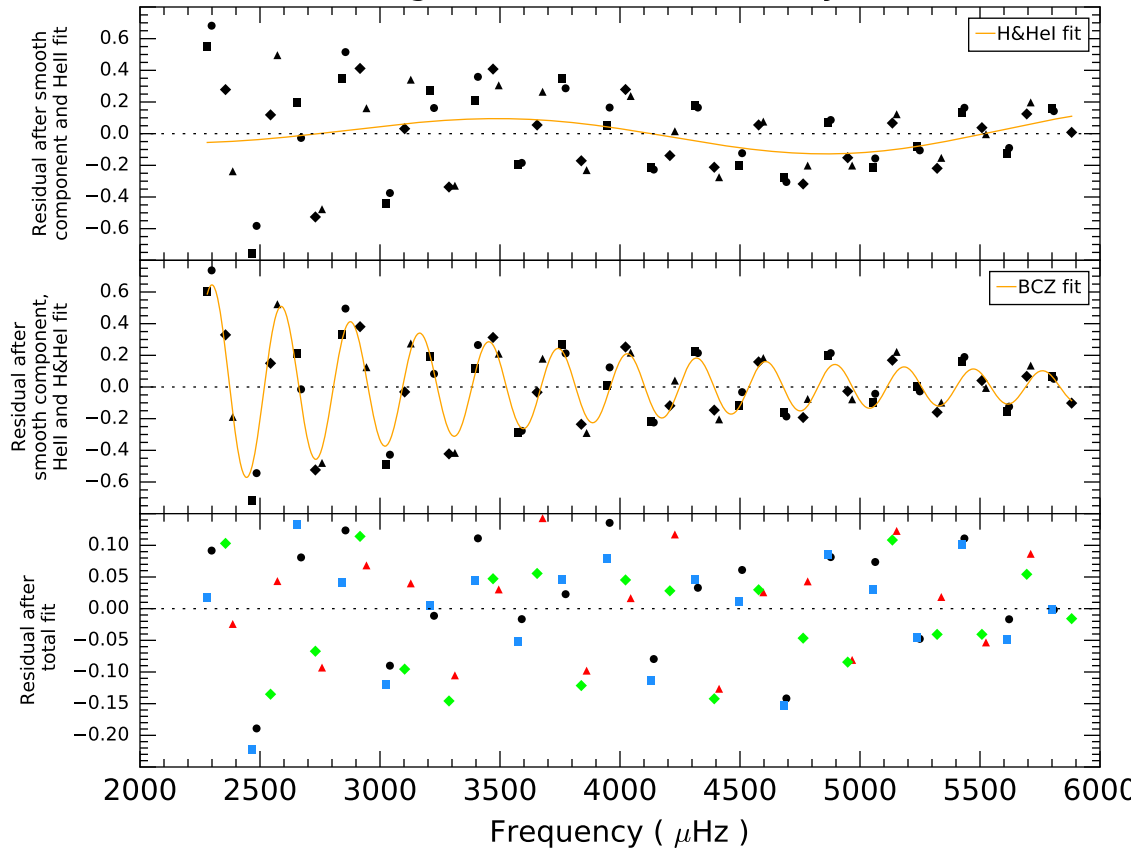


$$\begin{aligned}
 a_0 &= -8.1223 \mu \text{ Hz} \\
 a_1 &= 0.0036198 \\
 a_2 &= -3.8349e-07 \mu \text{ Hz}^{-2} \\
 c_0 &= 0.0014154 \\
 c_2 &= 1.8519e-07 \mu \text{ Hz}^{-2} \\
 \tau_{HeII} &= 481.92 \text{ s} \\
 \phi_{HeII} &= 3.857 \\
 b_2 &= 3.3941e+06 \text{ mHz}^3 \\
 \tau_{CZ} &= 1725.0 \text{ s} \\
 \phi_{CZ} &= 1.7822 \\
 d_0 &= 5.9059e-05 \\
 d_2 &= 5.1823e-08 \mu \text{ Hz}^{-2} \\
 \tau_{HI} &= 242.04 \text{ s} \\
 \phi_{HI} &= 2.9268
 \end{aligned}$$

profile33

$$\chi^2_\nu(\text{dof} = 65) = 0.0098693$$

# Age after ZAMS: 6.610 Gyr



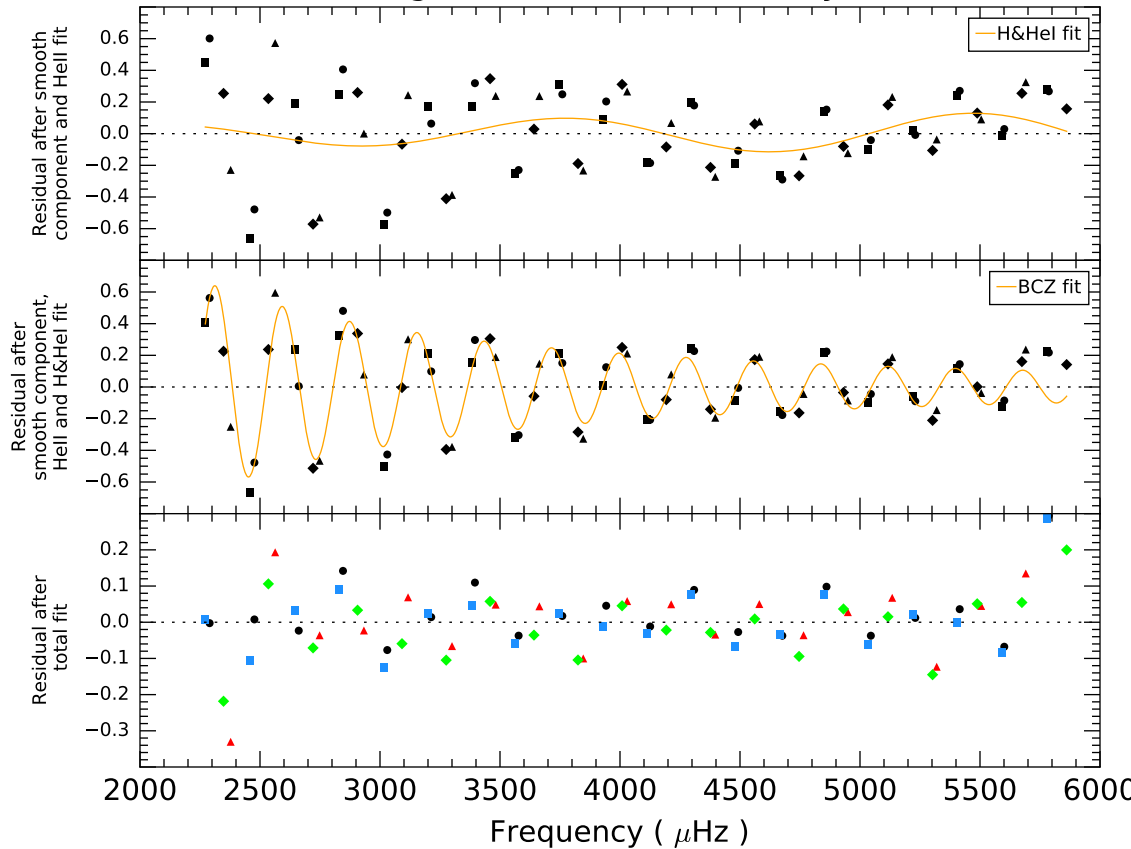
- $\bullet$   $\ell=0$
- $\blacktriangle$   $\ell=1$
- $\blacksquare$   $\ell=2$
- $\blacklozenge$   $\ell=3$

$$\begin{aligned}
 a_0 &= -8.5765 \mu\text{Hz} \\
 a_1 &= 0.0038157 \\
 a_2 &= -4.0253e-07 \mu\text{Hz}^{-2} \\
 c_0 &= 0.0013785 \\
 c_2 &= 1.8647e-07 \mu\text{Hz}^{-2} \\
 \tau_{HeII} &= 475.21 \text{ s} \\
 \phi_{HeII} &= 4.25 \\
 b_2 &= 3.4138e+06 \text{ mHz}^3 \\
 \tau_{CZ} &= 1734.3 \text{ s} \\
 \phi_{CZ} &= 1.6773 \\
 d_0 &= 2.8634e-05 \\
 d_2 &= 3.4553e-09 \mu\text{Hz}^{-2} \\
 \tau_{HI} &= 180.29 \text{ s} \\
 \phi_{HI} &= 0.06771
 \end{aligned}$$

profile34

$$\chi^2_\nu(\text{dof} = 65) = 0.0091359$$

# Age after ZAMS: 6.910 Gyr



$$a_0 = -8.2759 \mu \text{ Hz}$$

$$a_1 = 0.0037612$$

$$a_2 = -4.0689e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0011681$$

$$c_2 = 1.7449e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 493.81 \text{ s}$$

$$\phi_{\text{HeII}} = 3.5627$$

$$b_2 = 3.4209e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1783.0 \text{ s}$$

$$\phi_{\text{CZ}} = 6.2816$$

$$d_0 = 2.8274e-05$$

$$d_2 = 6.0475e-09 \mu\text{Hz}^{-2}$$

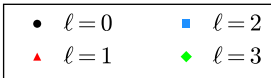
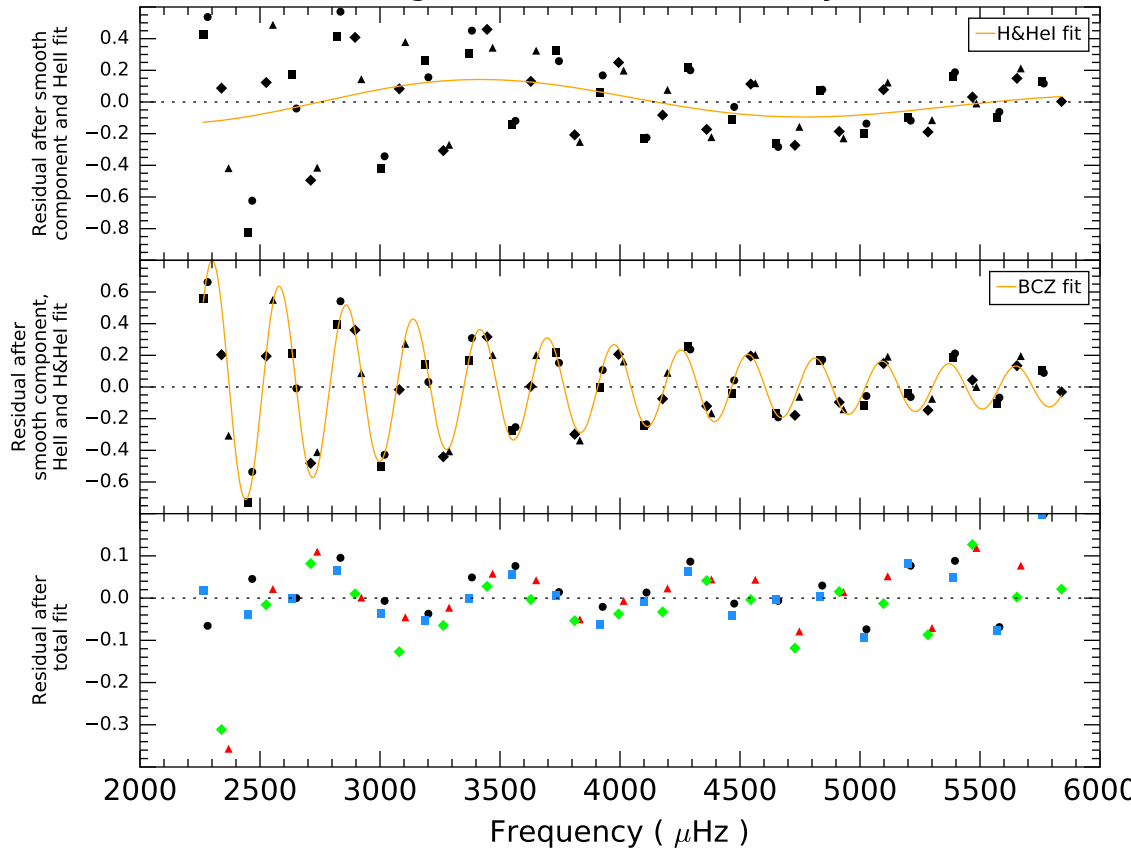
$$\tau_{\text{HI}} = 292.57 \text{ s}$$

$$\phi_{\text{HI}} = 0.3311$$

profile35

$$\chi^2_{\nu}(\text{dof} = 65) = 0.010929$$

Age after ZAMS: 7.210 Gyr



$$\begin{aligned} a_0 &= -8.3706 \mu \text{ Hz} \\ a_1 &= 0.0037372 \\ a_2 &= -3.9618e-07 \mu \text{ Hz}^{-2} \end{aligned}$$

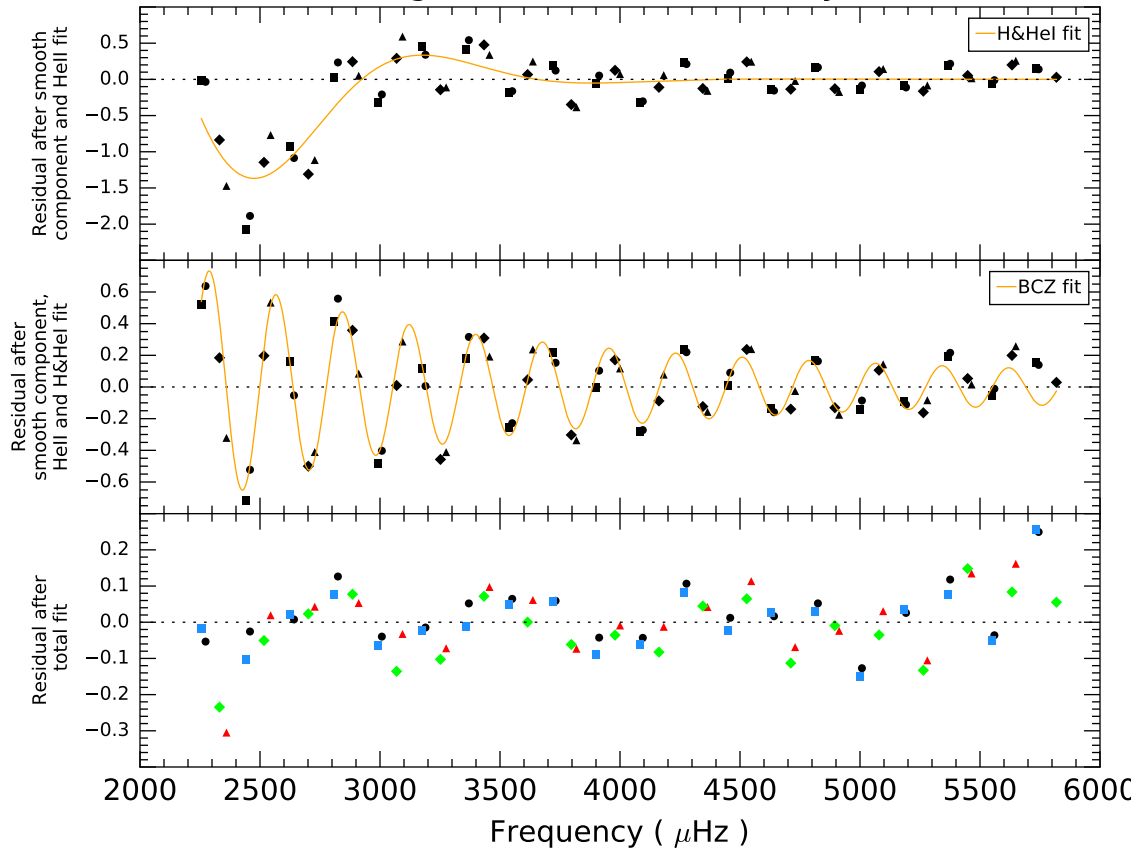
$$\begin{aligned} c_0 &= 0.001256 \\ c_2 &= 1.7805e-07 \mu \text{ Hz}^{-2} \\ \tau_{HeII} &= 466.39 \text{ s} \\ \phi_{HeII} &= 4.757 \\ b_2 &= 4.2363e+06 \text{ mHz}^3 \\ \tau_{CZ} &= 1792.3 \text{ s} \\ \phi_{CZ} &= 6.2671 \end{aligned}$$

$$\begin{aligned} d_0 &= 8.9376e-05 \\ d_2 &= 6.5221e-08 \mu \text{ Hz}^{-2} \\ \tau_{HI} &= 178.69 \text{ s} \\ \phi_{HI} &= 0.10977 \end{aligned}$$

profile36

$$\chi^2_\nu (\text{dof} = 65) = 0.0083667$$

Age after ZAMS: 7.510 Gyr



$$a_0 = -6.7585 \mu\text{Hz}$$

$$a_1 = 0.0030707$$

$$a_2 = -3.3007e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0032488$$

$$c_2 = 2.3105e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 430.75 \text{ s}$$

$$\phi_{\text{HeII}} = 0.00014415$$

$$b_2 = 3.8402e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1801.4 \text{ s}$$

$$\phi_{\text{CZ}} = 6.2831$$

$$d_0 = 0.006991$$

$$d_2 = 4.0364e-07 \mu\text{Hz}^{-2}$$

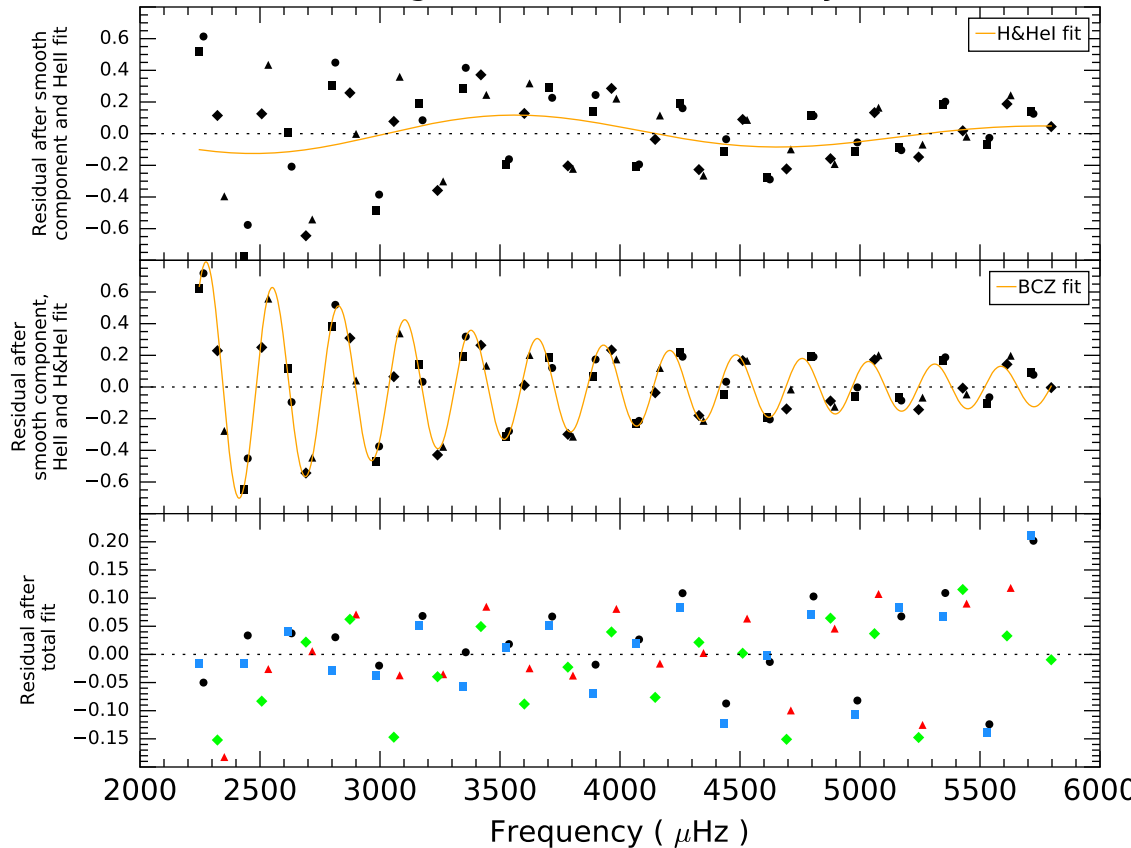
$$\tau_{\text{HI}} = 342.08 \text{ s}$$

$$\phi_{\text{HI}} = 0.00015599$$

profile37

$$\chi^2_{\nu}(\text{dof} = 65) = 0.010287$$

# Age after ZAMS: 7.810 Gyr



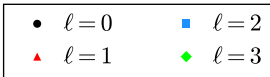
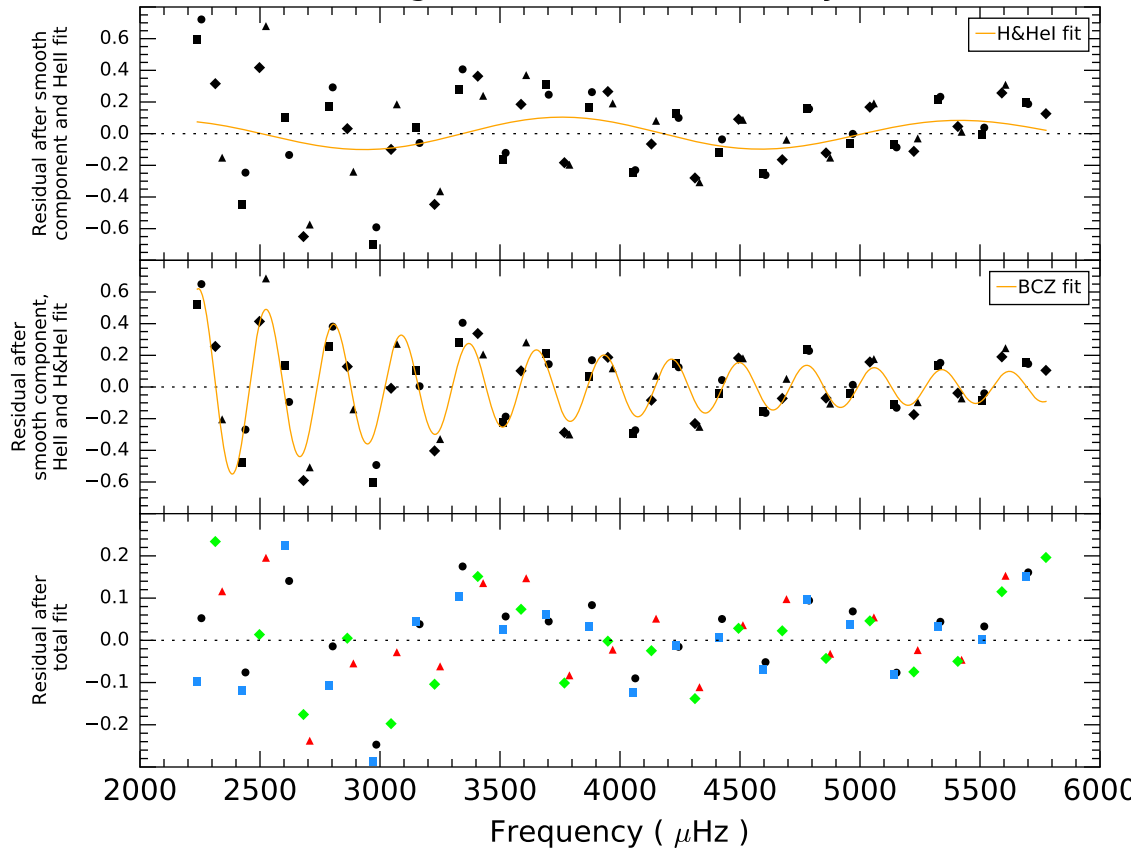
- $\bullet$   $\ell=0$
- $\blacktriangle$   $\ell=1$
- $\blacksquare$   $\ell=2$
- $\blacklozenge$   $\ell=3$

$$\begin{aligned}
 a_0 &= -7.8848 \mu \text{ Hz} \\
 a_1 &= 0.0035769 \\
 a_2 &= -3.8509e-07 \mu \text{ Hz}^{-2} \\
 c_0 &= 0.0014706 \\
 c_2 &= 1.9401e-07 \mu \text{ Hz}^{-2} \\
 \tau_{\text{HeII}} &= 487.73 \text{ s} \\
 \phi_{\text{HeII}} &= 4.113 \\
 b_2 &= 4.0938e+06 \text{ mHz}^3 \\
 \tau_{\text{CZ}} &= 1812.1 \text{ s} \\
 \phi_{\text{CZ}} &= 6.2763 \\
 d_0 &= 7.5659e-05 \\
 d_2 &= 6.536e-08 \mu \text{ Hz}^{-2} \\
 \tau_{\text{HI}} &= 222.44 \text{ s} \\
 \phi_{\text{HI}} &= 4.1154
 \end{aligned}$$

profile38

$$\chi^2_\nu(\text{dof} = 65) = 0.0080319$$

# Age after ZAMS: 8.110 Gyr

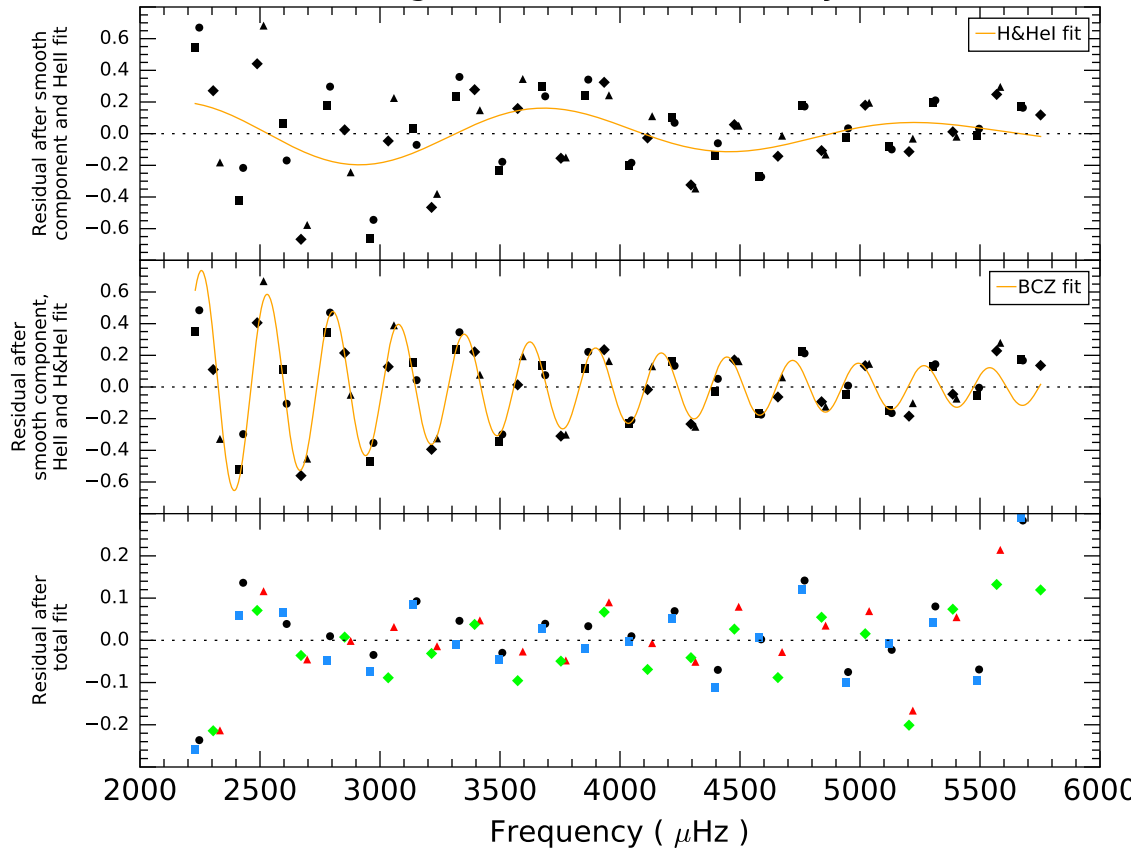


$$\begin{aligned}
 a_0 &= -7.7117 \mu \text{ Hz} \\
 a_1 &= 0.0035567 \\
 a_2 &= -3.895e-07 \mu\text{Hz}^{-1} \\
 c_0 &= 0.0015263 \\
 c_2 &= 2.1147e-07 \mu\text{Hz}^{-2} \\
 \tau_{\text{HeII}} &= 511.21 \text{ s} \\
 \phi_{\text{HeII}} &= 3.1246 \\
 b_2 &= 3.1284e+06 \text{ mHz}^3 \\
 \tau_{\text{CZ}} &= 1776.1 \text{ s} \\
 \phi_{\text{CZ}} &= 1.7267 \\
 d_0 &= 4.7613e-05 \\
 d_2 &= 3.816e-08 \mu\text{Hz}^{-2} \\
 \tau_{\text{HI}} &= 299.2 \text{ s} \\
 \phi_{\text{HI}} &= 3.0999e-12
 \end{aligned}$$

profile39

$$\chi^2_{\nu}(\text{dof} = 65) = 0.014167$$

# Age after ZAMS: 8.410 Gyr



- $\bullet$   $\ell=0$
- $\blacktriangle$   $\ell=1$
- $\blacksquare$   $\ell=2$
- $\blacklozenge$   $\ell=3$

$$a_0 = -7.4769 \mu\text{Hz}$$

$$a_1 = 0.0034624$$

$$a_2 = -3.8032e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0013971$$

$$c_2 = 2.0196e-07 \mu\text{Hz}^{-2}$$

$$\tau_{HeII} = 530.4 \text{ s}$$

$$\phi_{HeII} = 2.5787$$

$$b_2 = 3.7473e+06 \text{ mHz}^3$$

$$\tau_{CZ} = 1827.3 \text{ s}$$

$$\phi_{CZ} = 6.2832$$

$$d_0 = 0.00013868$$

$$d_2 = 8.466e-08 \mu\text{Hz}^{-2}$$

$$\tau_{HI} = 319.76 \text{ s}$$

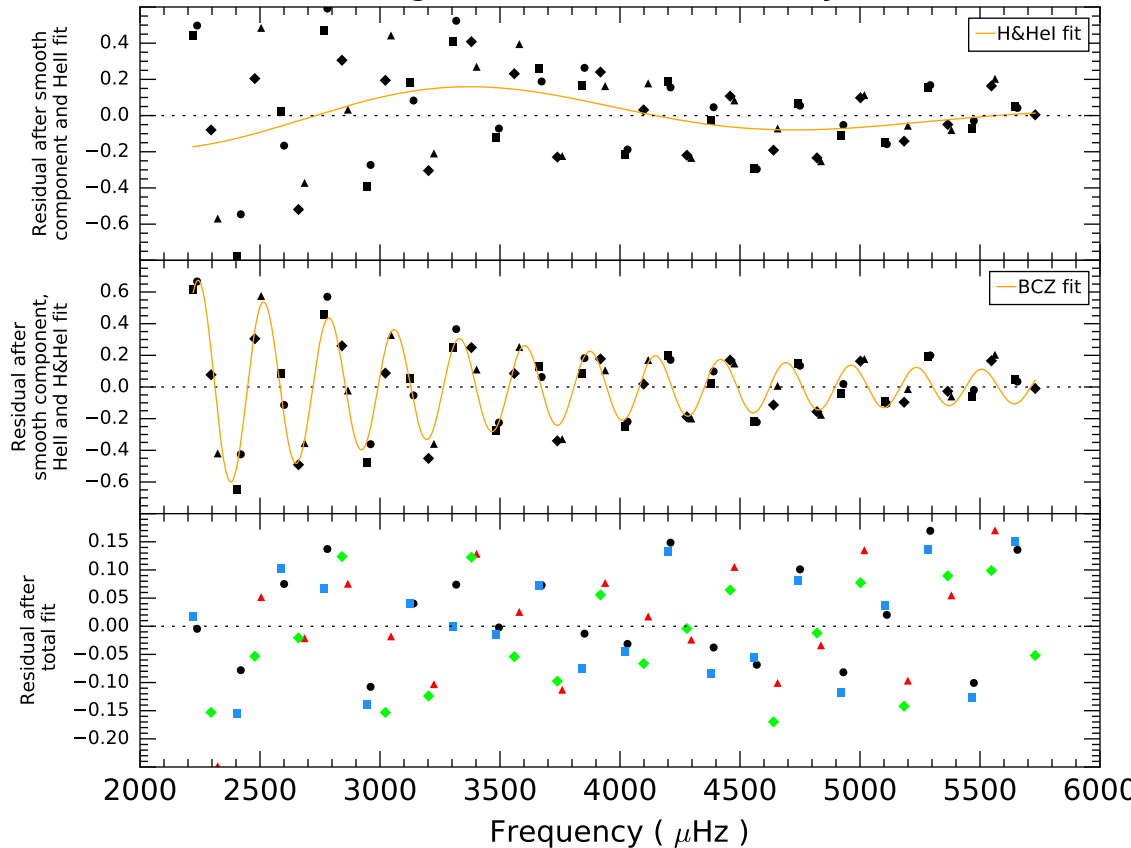
$$\phi_{HI} = 5.5337$$

profile40

$$\chi^2_\nu(\text{dof} = 65) = 0.012144$$



# Age after ZAMS: 8.710 Gyr



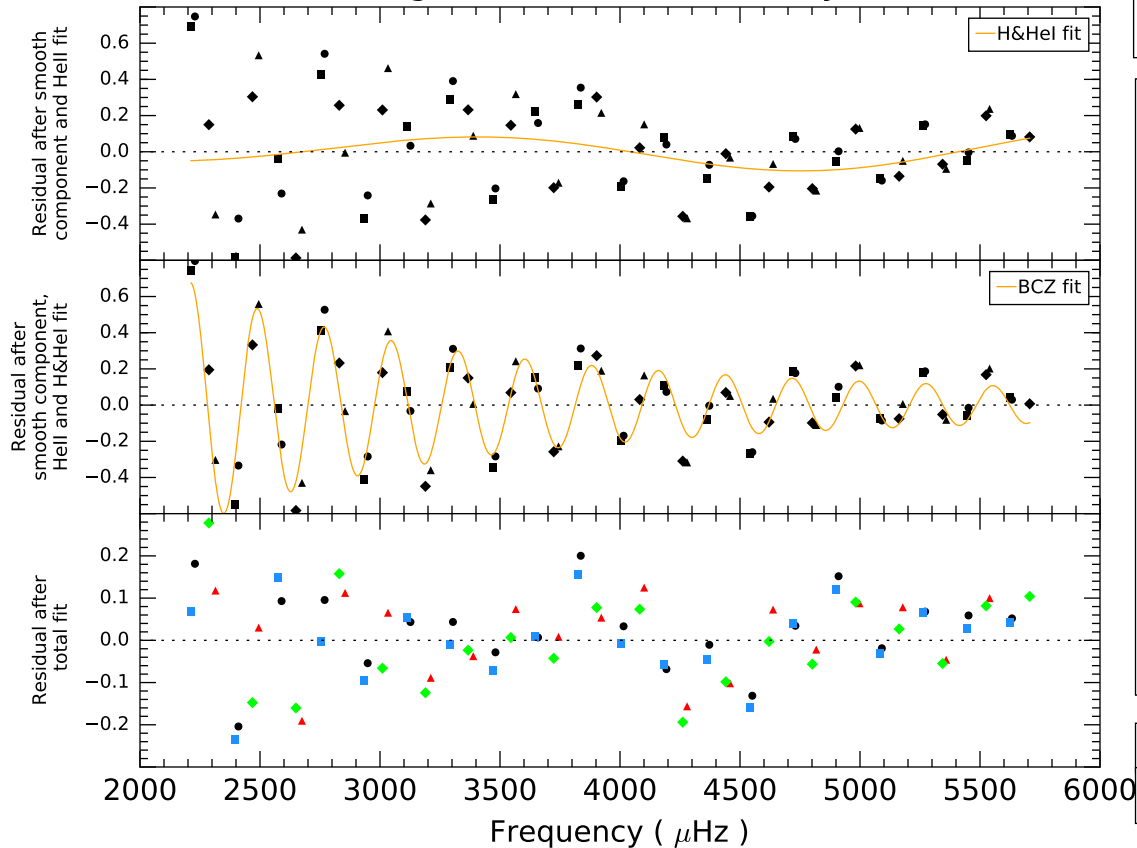
- $\bullet$   $\ell = 0$
- $\blacktriangle$   $\ell = 1$
- $\blacksquare$   $\ell = 2$
- $\blacklozenge$   $\ell = 3$

$$\begin{aligned}
 a_0 &= -7.9482 \mu \text{ Hz} \\
 a_1 &= 0.0036152 \\
 a_2 &= -3.9013e-07 \mu\text{Hz}^{-2} \\
 c_0 &= 0.0013654 \\
 c_2 &= 1.903e-07 \mu\text{Hz}^{-2} \\
 \tau_{\text{HeII}} &= 480.38 \text{ s} \\
 \phi_{\text{HeII}} &= 4.6998 \\
 b_2 &= 3.392e+06 \text{ mHz}^3 \\
 \tau_{\text{CZ}} &= 1838.3 \text{ s} \\
 \phi_{\text{CZ}} &= 6.2832 \\
 d_0 &= 0.00013489 \\
 d_2 &= 9.1241e-08 \mu\text{Hz}^{-2} \\
 \tau_{\text{HI}} &= 176.24 \text{ s} \\
 \phi_{\text{HI}} &= 0.24096
 \end{aligned}$$

profile41

$$\chi^2_{\nu}(\text{dof} = 65) = 0.011306$$

# Age after ZAMS: 9.010 Gyr



- $\bullet$   $\ell = 0$
- $\blacktriangle$   $\ell = 1$
- $\blacksquare$   $\ell = 2$
- $\blacklozenge$   $\ell = 3$

$$a_0 = -8.2561 \mu \text{ Hz}$$

$$a_1 = 0.0038276$$

$$a_2 = -4.2041e-07 \mu\text{Hz}^{-1}$$

$$c_0 = 0.0014501$$

$$c_2 = 1.9425e-07 \mu\text{Hz}^{-2}$$

$$\tau_{HeII} = 515.04 \text{ s}$$

$$\phi_{HeII} = 3.5644$$

$$b_2 = 3.3083e+06 \text{ mHz}^3$$

$$\tau_{CZ} = 1794.9 \text{ s}$$

$$\phi_{CZ} = 1.9549$$

$$d_0 = 2.641e-05$$

$$d_2 = 7.463e-09 \mu\text{Hz}^{-2}$$

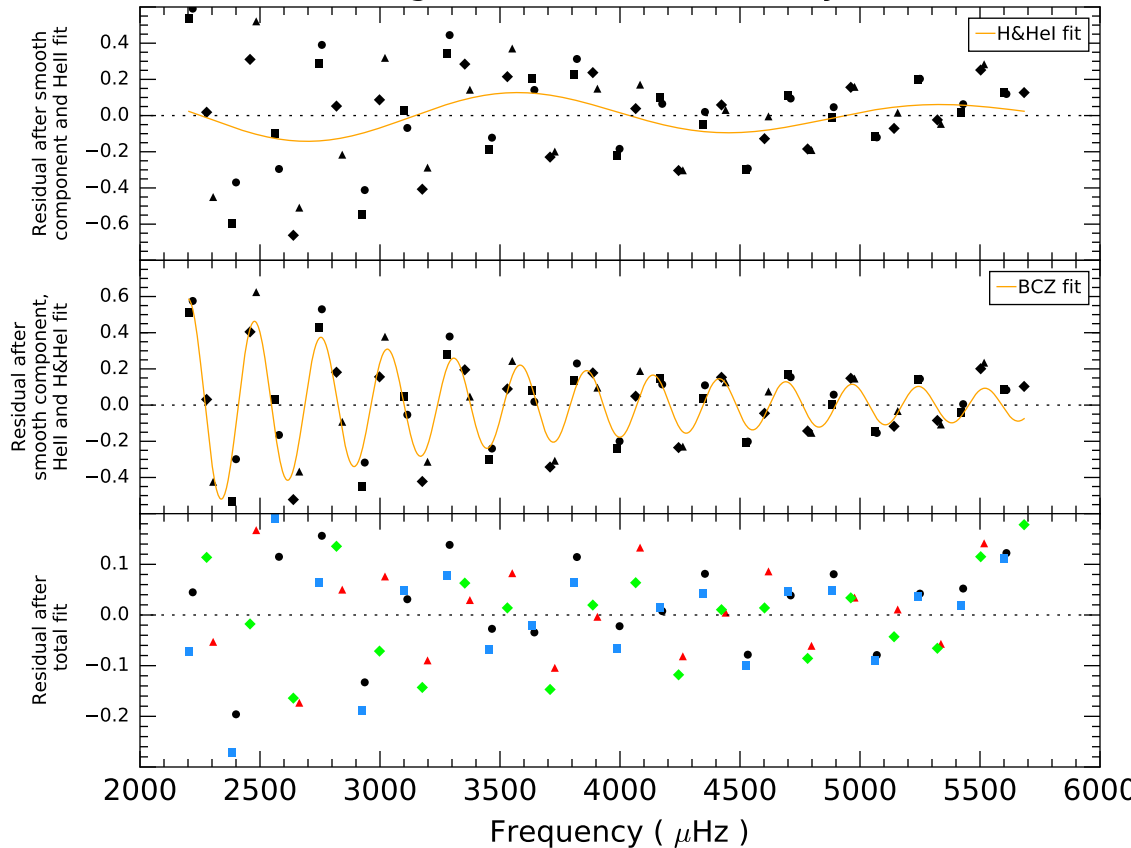
$$\tau_{HI} = 183.03 \text{ s}$$

$$\phi_{HI} = 0.12597$$

profile42

$$\chi^2_\nu(\text{dof} = 65) = 0.012435$$

# Age after ZAMS: 9.310 Gyr



- $\bullet$   $\ell = 0$
- $\blacktriangle$   $\ell = 1$
- $\blacksquare$   $\ell = 2$
- $\blacklozenge$   $\ell = 3$

$$a_0 = -7.5748 \mu \text{ Hz}$$

$$a_1 = 0.0035541$$

$$a_2 = -3.9534e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0014398$$

$$c_2 = 2.0268e-07 \mu\text{Hz}^{-2}$$

$$\tau_{HeII} = 511.54 \text{ s}$$

$$\phi_{HeII} = 3.6611$$

$$b_2 = 2.8436e+06 \text{ mHz}^3$$

$$\tau_{CZ} = 1807.5 \text{ s}$$

$$\phi_{CZ} = 1.8215$$

$$d_0 = 8.8831e-05$$

$$d_2 = 7.1557e-08 \mu\text{Hz}^{-2}$$

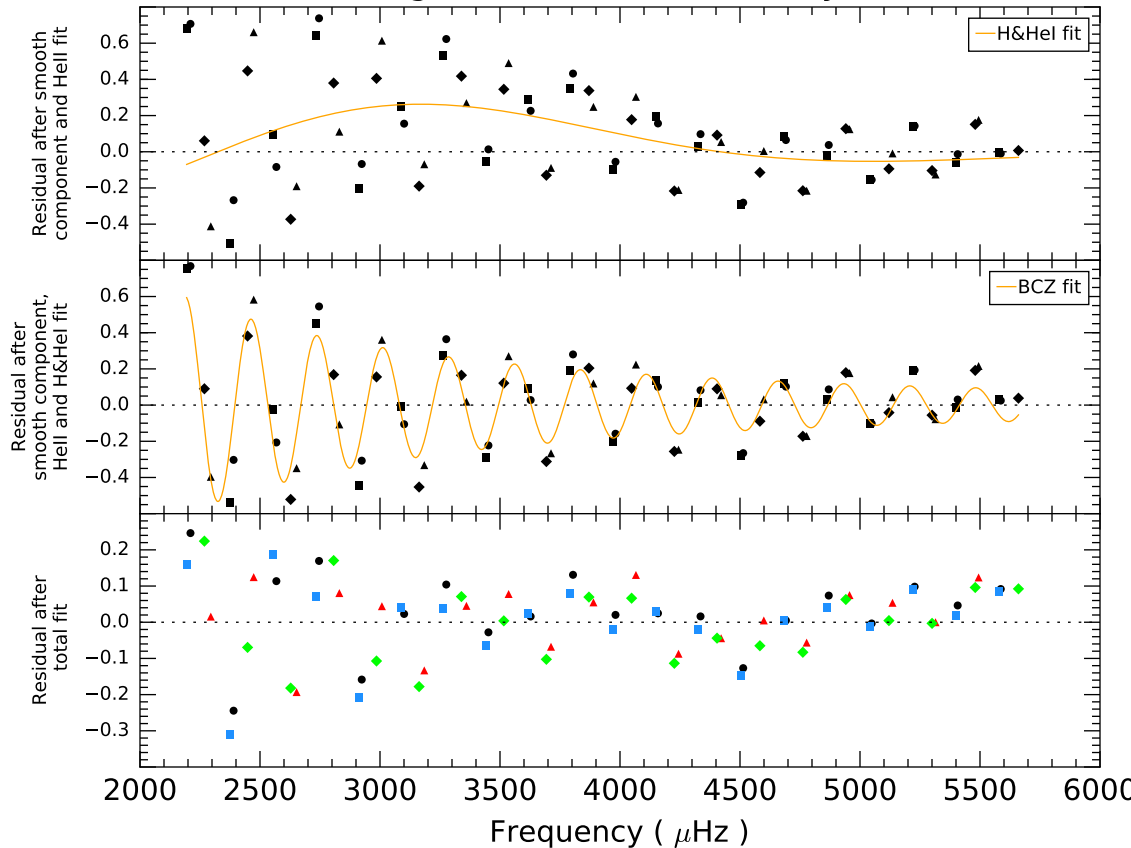
$$\tau_{HI} = 279.82 \text{ s}$$

$$\phi_{HI} = 1.5088$$

profile43

$$\chi^2_\nu(\text{dof} = 65) = 0.011341$$

# Age after ZAMS: 9.610 Gyr



- $\bullet$   $\ell=0$
- $\blacktriangle$   $\ell=1$
- $\blacksquare$   $\ell=2$
- $\blacklozenge$   $\ell=3$

$$a_0 = -8.1105 \mu \text{ Hz}$$

$$a_1 = 0.0036669$$

$$a_2 = -3.9548e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0013747$$

$$c_2 = 1.9206e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 500.91 \text{ s}$$

$$\phi_{\text{HeII}} = 4.2753$$

$$b_2 = 2.8805e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1821.8 \text{ s}$$

$$\phi_{\text{CZ}} = 1.7187$$

$$d_0 = 0.00029963$$

$$d_2 = 1.2329e-07 \mu\text{Hz}^{-2}$$

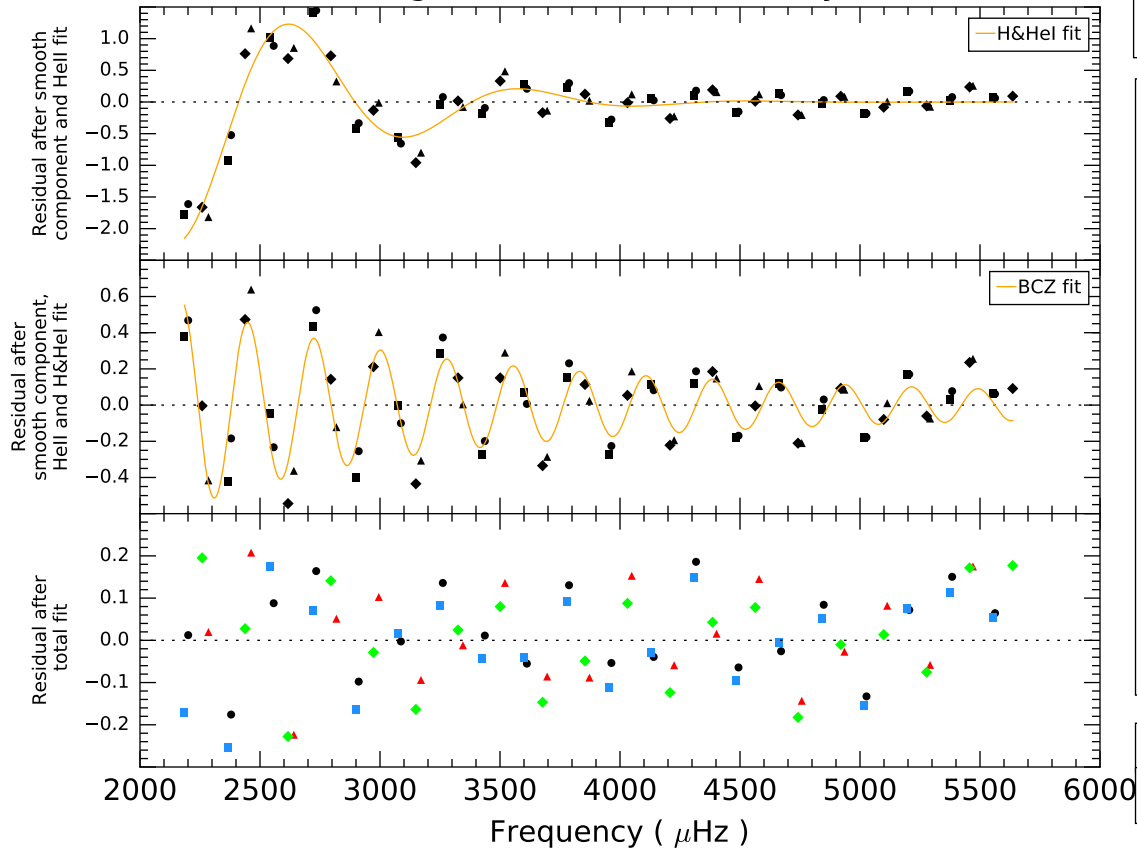
$$\tau_{\text{HI}} = 119.48 \text{ s}$$

$$\phi_{\text{HI}} = 2.7945$$

profile44

$$\chi^2_{\nu}(\text{dof} = 65) = 0.013846$$

# Age after ZAMS: 9.910 Gyr



- $\bullet$   $\ell = 0$
- $\blacktriangle$   $\ell = 1$
- $\blacksquare$   $\ell = 2$
- $\blacklozenge$   $\ell = 3$

$$a_0 = -6.4605 \mu \text{ Hz}$$

$$a_1 = 0.0030664$$

$$a_2 = -3.4336e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0017379$$

$$c_2 = 2.4629e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 360.03 \text{ s}$$

$$\phi_{\text{HeII}} = 4.6308$$

$$b_2 = 2.7409e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1807.6 \text{ s}$$

$$\phi_{\text{CZ}} = 2.4787$$

$$d_0 = 0.0051901$$

$$d_2 = 3.4673e-07 \mu\text{Hz}^{-2}$$

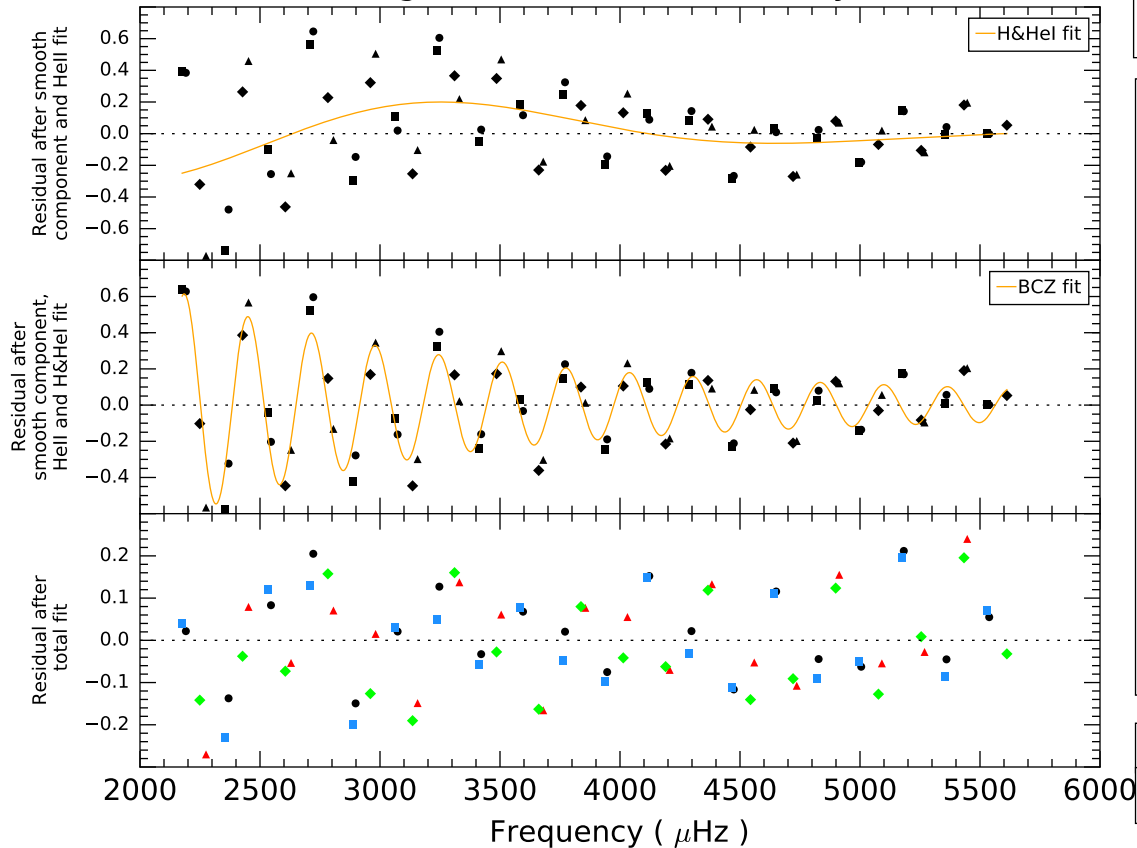
$$\tau_{\text{HI}} = 514.65 \text{ s}$$

$$\phi_{\text{HI}} = 3.2634$$

profile45

$$\chi^2_{\nu}(\text{dof} = 65) = 0.016022$$

# Age after ZAMS: 10.210 Gyr



- $\bullet$   $\ell=0$
- $\blacktriangle$   $\ell=1$
- $\blacksquare$   $\ell=2$
- $\blacklozenge$   $\ell=3$

$$a_0 = -7.7353 \mu \text{ Hz}$$

$$a_1 = 0.0035951$$

$$a_2 = -3.9671e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0015359$$

$$c_2 = 2.0809e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 486.66 \text{ s}$$

$$\phi_{\text{HeII}} = 4.9931$$

$$b_2 = 2.9343e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1887.3 \text{ s}$$

$$\phi_{\text{CZ}} = 6.2832$$

$$d_0 = 0.00026162$$

$$d_2 = 1.3362e-07 \mu\text{Hz}^{-2}$$

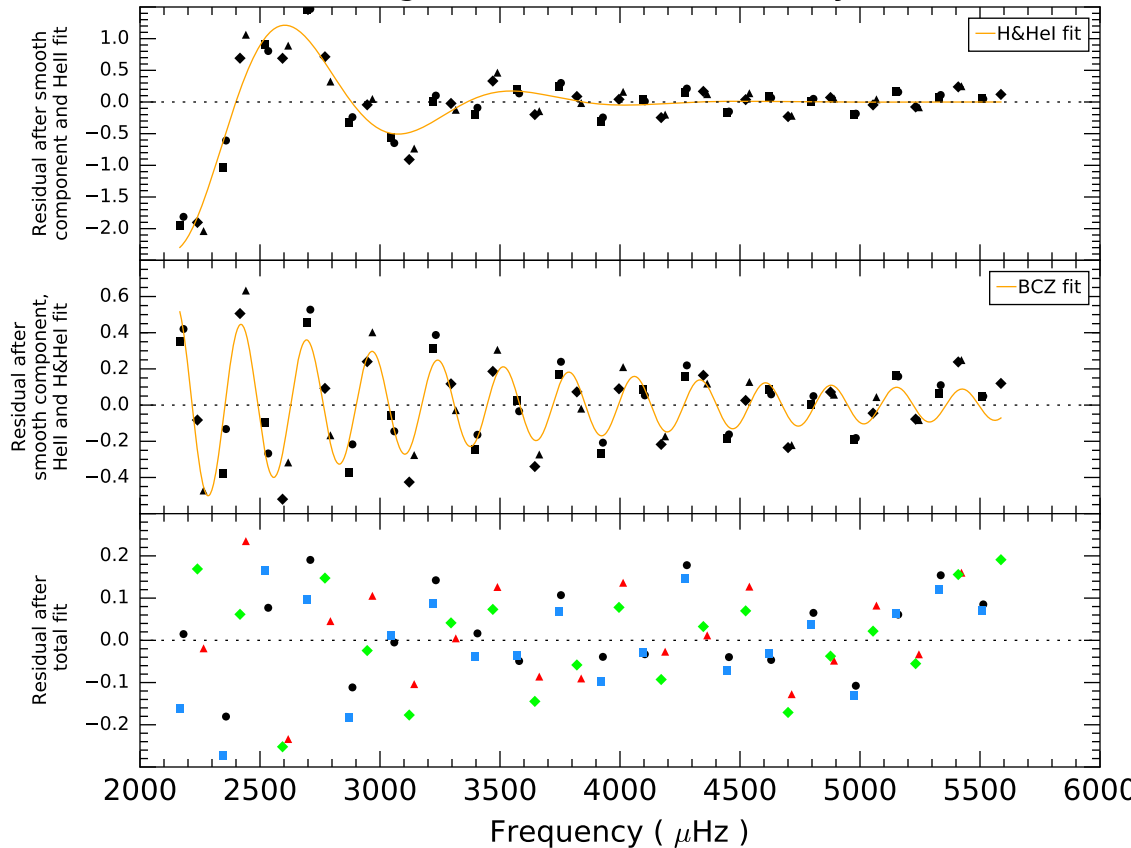
$$\tau_{\text{HI}} = 168.61 \text{ s}$$

$$\phi_{\text{HI}} = 0.70195$$

profile46

$$\chi^2_{\nu}(\text{dof} = 65) = 0.016259$$

# Age after ZAMS: 10.510 Gyr



$$a_0 = -6.384 \mu\text{Hz}$$

$$a_1 = 0.0030685$$

$$a_2 = -3.4772e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0019765$$

$$c_2 = 2.5064e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 374.24 \text{ s}$$

$$\phi_{\text{HeII}} = 4.1733$$

$$b_2 = 2.6163e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1830.7 \text{ s}$$

$$\phi_{\text{CZ}} = 2.3948$$

$$d_0 = 0.0063443$$

$$d_2 = 3.8105e-07 \mu\text{Hz}^{-2}$$

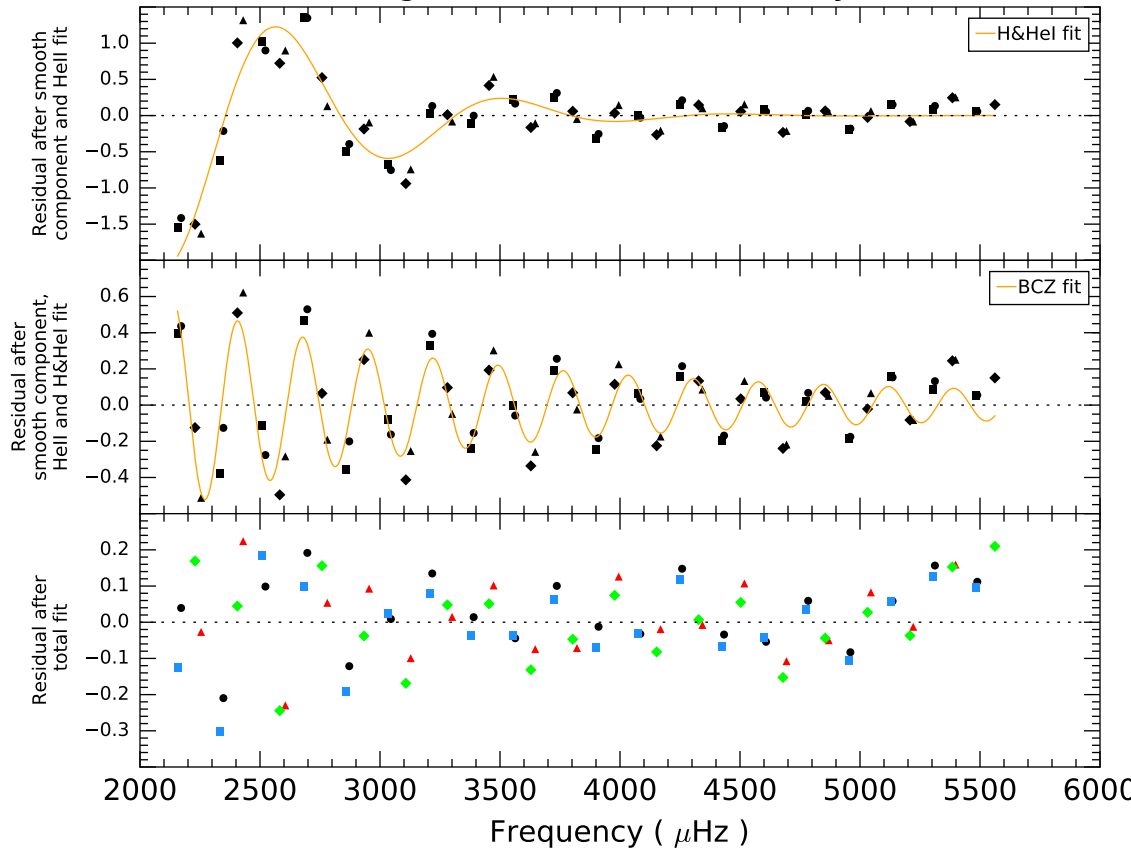
$$\tau_{\text{HI}} = 519.3 \text{ s}$$

$$\phi_{\text{HI}} = 3.1914$$

profile47

$$\chi^2_{\nu}(\text{dof} = 65) = 0.015798$$

# Age after ZAMS: 10.810 Gyr



- $\bullet$   $\ell = 0$
- $\blacktriangle$   $\ell = 1$
- $\blacksquare$   $\ell = 2$
- $\blacklozenge$   $\ell = 3$

$$a_0 = -6.5158 \mu \text{ Hz}$$

$$a_1 = 0.003153$$

$$a_2 = -3.5994e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0016066$$

$$c_2 = 2.5259e-07 \mu\text{Hz}^{-2}$$

$$\tau_{HeII} = 364.98 \text{ s}$$

$$\phi_{HeII} = 4.7463$$

$$b_2 = 2.6936e+06 \text{ mHz}^3$$

$$\tau_{CZ} = 1843.6 \text{ s}$$

$$\phi_{CZ} = 2.3351$$

$$d_0 = 0.004437$$

$$d_2 = 3.3554e-07 \mu\text{Hz}^{-2}$$

$$\tau_{HI} = 521.71 \text{ s}$$

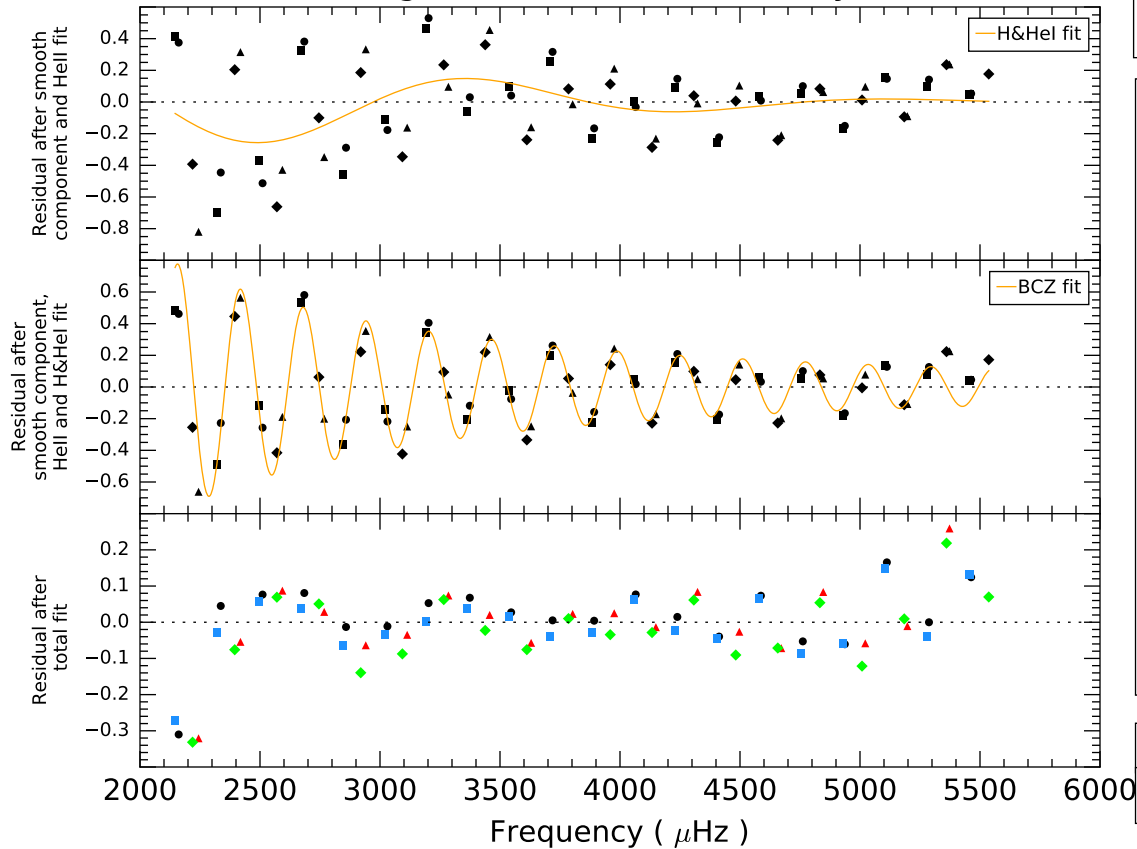
$$\phi_{HI} = 3.4059$$

profile48

$$\chi^2_{\nu}(\text{dof} = 65) = 0.015111$$



Age after ZAMS: 11.110 Gyr



$$a_0 = -7.0498 \mu \text{ Hz}$$

$$a_1 = 0.0034148$$

$$a_2 = -3.9119e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0018957$$

$$c_2 = 2.4211e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 509.48 \text{ s}$$

$$\phi_{\text{HeII}} = 4.4111$$

$$b_2 = 3.616e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1911.7 \text{ s}$$

$$\phi_{\text{CZ}} = 6.2775$$

$$d_0 = 0.0002861$$

$$d_2 = 1.635e-07 \mu\text{Hz}^{-2}$$

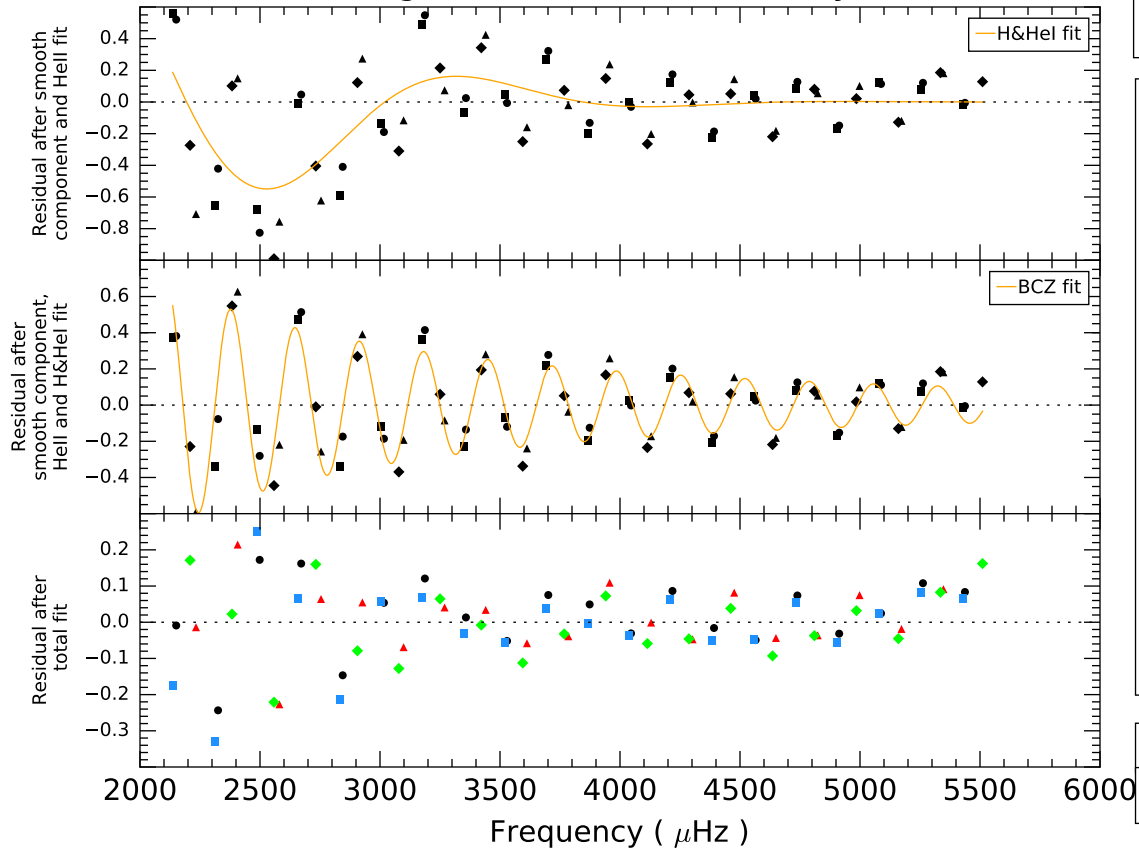
$$\tau_{\text{HI}} = 278.91 \text{ s}$$

$$\phi_{\text{HI}} = 2.1554$$

profile49

$$\chi^2_{\nu}(\text{dof} = 65) = 0.012348$$

Age after ZAMS: 11.410 Gyr



$$a_0 = -5.9133 \mu \text{ Hz}$$

$$a_1 = 0.0028907$$

$$a_2 = -3.3215e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0023384$$

$$c_2 = 2.5766e-07 \mu\text{Hz}^{-2}$$

$$\tau_{HeII} = 525.55 \text{ s}$$

$$\phi_{HeII} = 3.8013$$

$$b_2 = 2.9991e+06 \text{ mHz}^3$$

$$\tau_{CZ} = 1867.3 \text{ s}$$

$$\phi_{CZ} = 2.2888$$

$$d_0 = 0.0016626$$

$$d_2 = 3.1128e-07 \mu\text{Hz}^{-2}$$

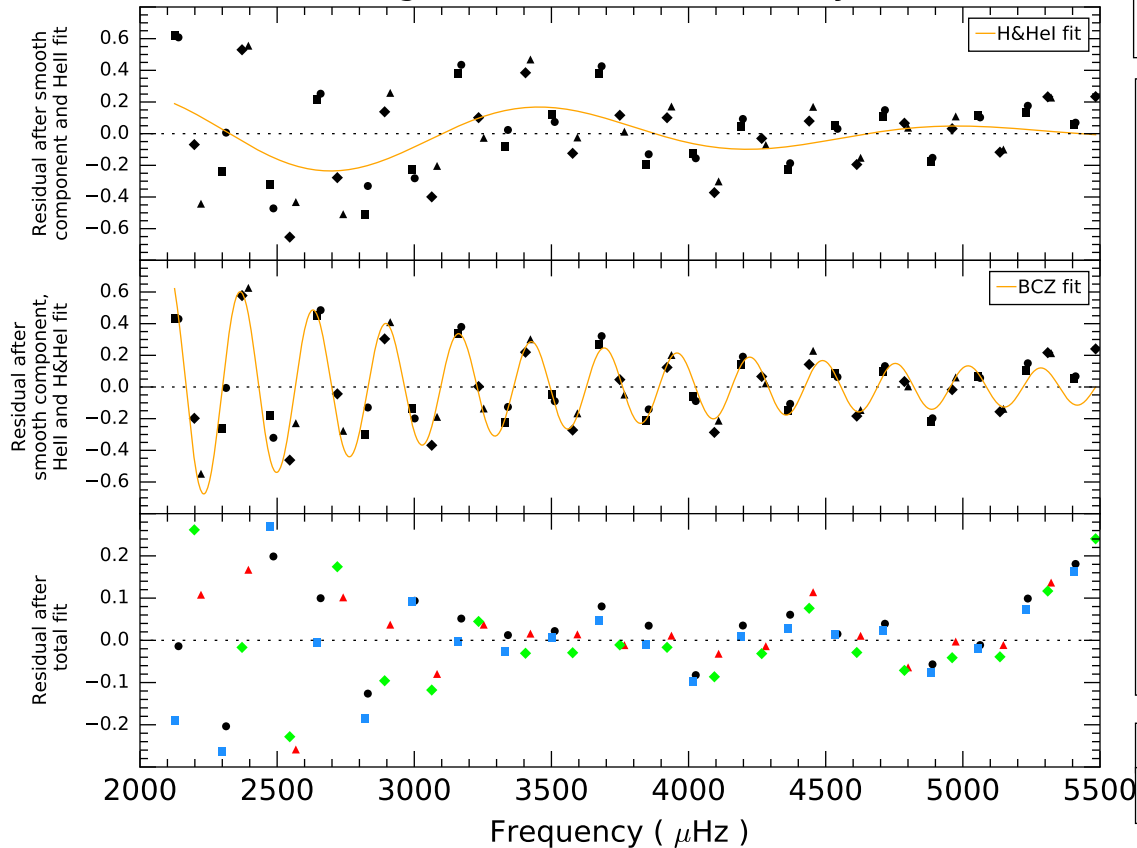
$$\tau_{HI} = 302.79 \text{ s}$$

$$\phi_{HI} = 1.0763$$

profile50

$$\chi^2_\nu(\text{dof} = 65) = 0.013142$$

# Age after ZAMS: 11.710 Gyr



$$a_0 = -6.8593 \mu\text{Hz}$$

$$a_1 = 0.0033799$$

$$a_2 = -3.933e-07 \mu\text{Hz}^{-1}$$

$$c_0 = 0.0016417$$

$$c_2 = 2.3842e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 566.78 \text{ s}$$

$$\phi_{\text{HeII}} = 2.5656$$

$$b_2 = 3.3686e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1884.6 \text{ s}$$

$$\phi_{\text{CZ}} = 2.0708$$

$$d_0 = 0.00021541$$

$$d_2 = 1.2379e-07 \mu\text{Hz}^{-2}$$

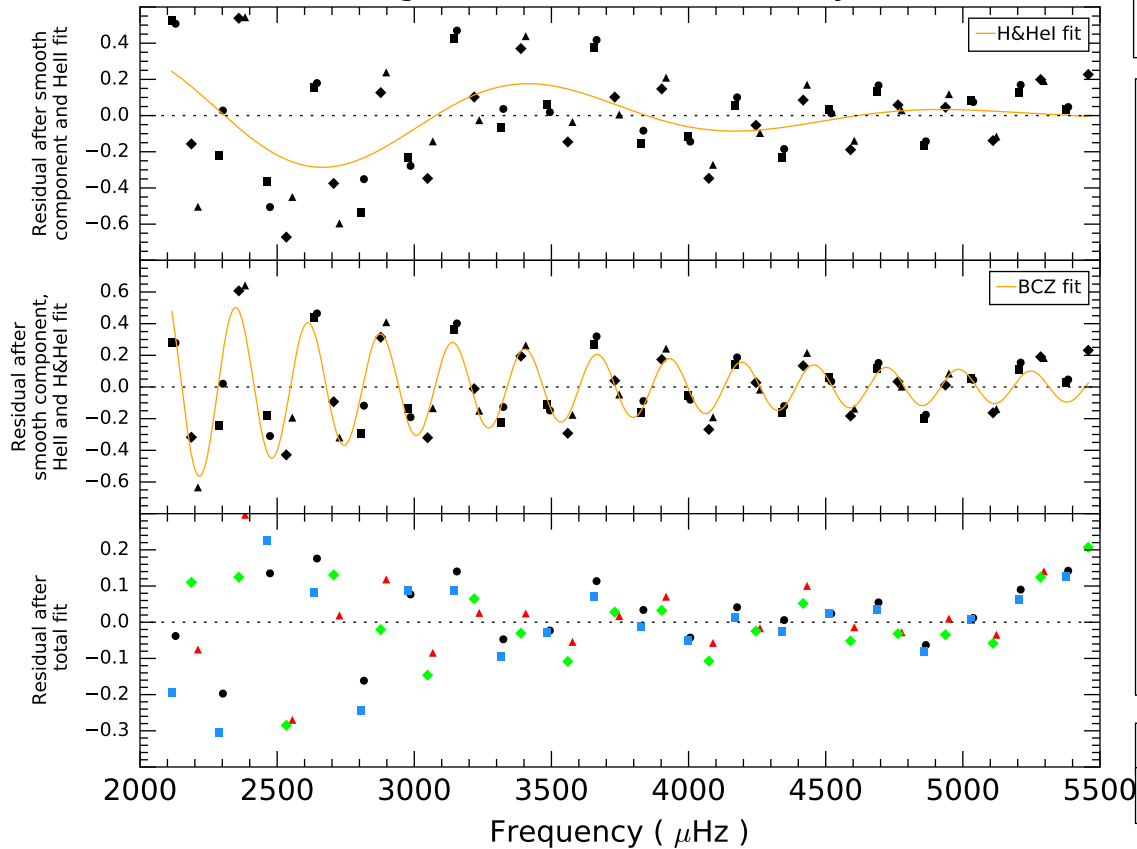
$$\tau_{\text{HI}} = 322.48 \text{ s}$$

$$\phi_{\text{HI}} = 1.392e-06$$

profile51

$$\chi^2_{\nu}(\text{dof} = 65) = 0.013786$$

# Age after ZAMS: 12.010 Gyr



- $\bullet$   $\ell = 0$
- $\blacktriangle$   $\ell = 1$
- $\blacksquare$   $\ell = 2$
- $\blacklozenge$   $\ell = 3$

$$a_0 = -6.5372 \mu \text{ Hz}$$

$$a_1 = 0.0032393$$

$$a_2 = -3.7842e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0014685$$

$$c_2 = 2.2497e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 565.99 \text{ s}$$

$$\phi_{\text{HeII}} = 2.6655$$

$$b_2 = 2.7712e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1897.7 \text{ s}$$

$$\phi_{\text{CZ}} = 2.0747$$

$$d_0 = 0.00033171$$

$$d_2 = 1.5798e-07 \mu\text{Hz}^{-2}$$

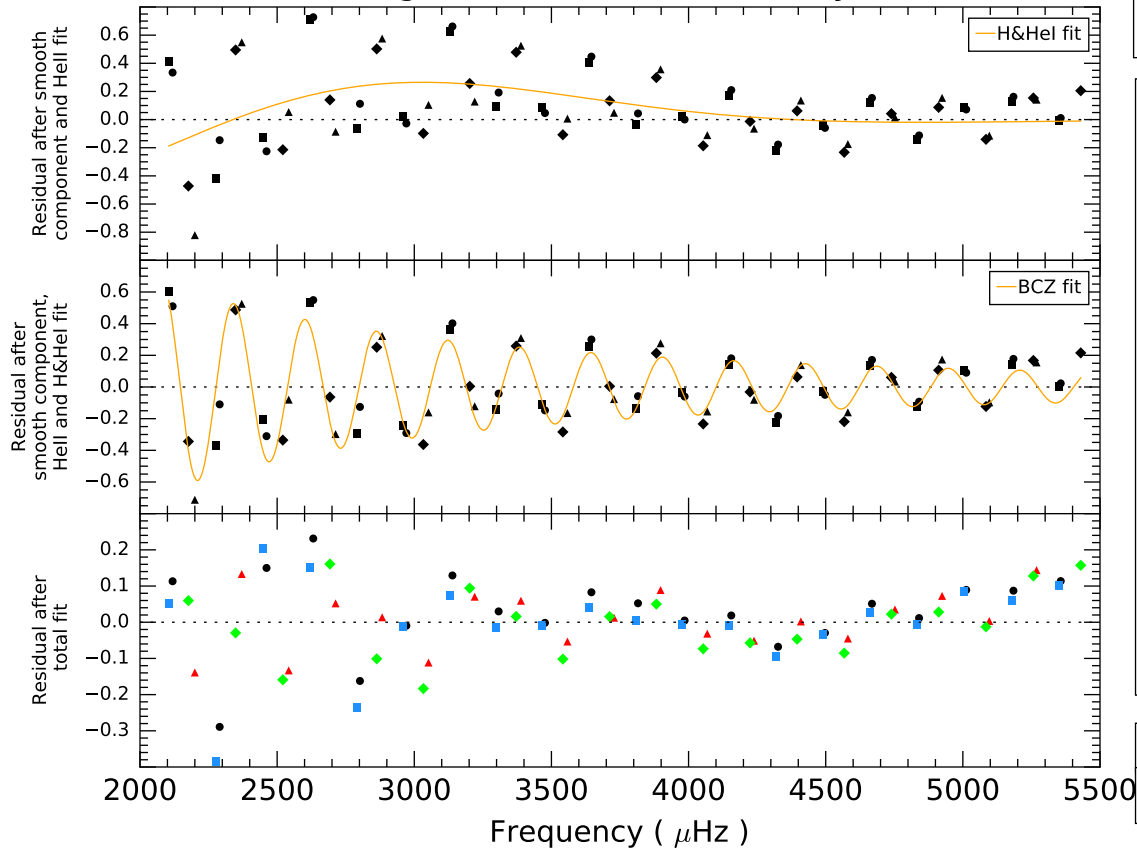
$$\tau_{\text{HI}} = 324.98 \text{ s}$$

$$\phi_{\text{HI}} = 0.00063568$$

profile52

$$\chi^2_{\nu}(\text{dof} = 65) = 0.015215$$

# Age after ZAMS: 12.310 Gyr



- $\ell = 0$
- ▲  $\ell = 1$
- $\ell = 2$
- ◆  $\ell = 3$

$$a_0 = -7.6824 \mu \text{ Hz}$$

$$a_1 = 0.0036838$$

$$a_2 = -4.2155e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0015479$$

$$c_2 = 2.196e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 514.93 \text{ s}$$

$$\phi_{\text{HeII}} = 4.8356$$

$$b_2 = 2.8876e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1918.9 \text{ s}$$

$$\phi_{\text{CZ}} = 1.6501$$

$$d_0 = 0.00060164$$

$$d_2 = 1.9545e-07 \mu\text{Hz}^{-2}$$

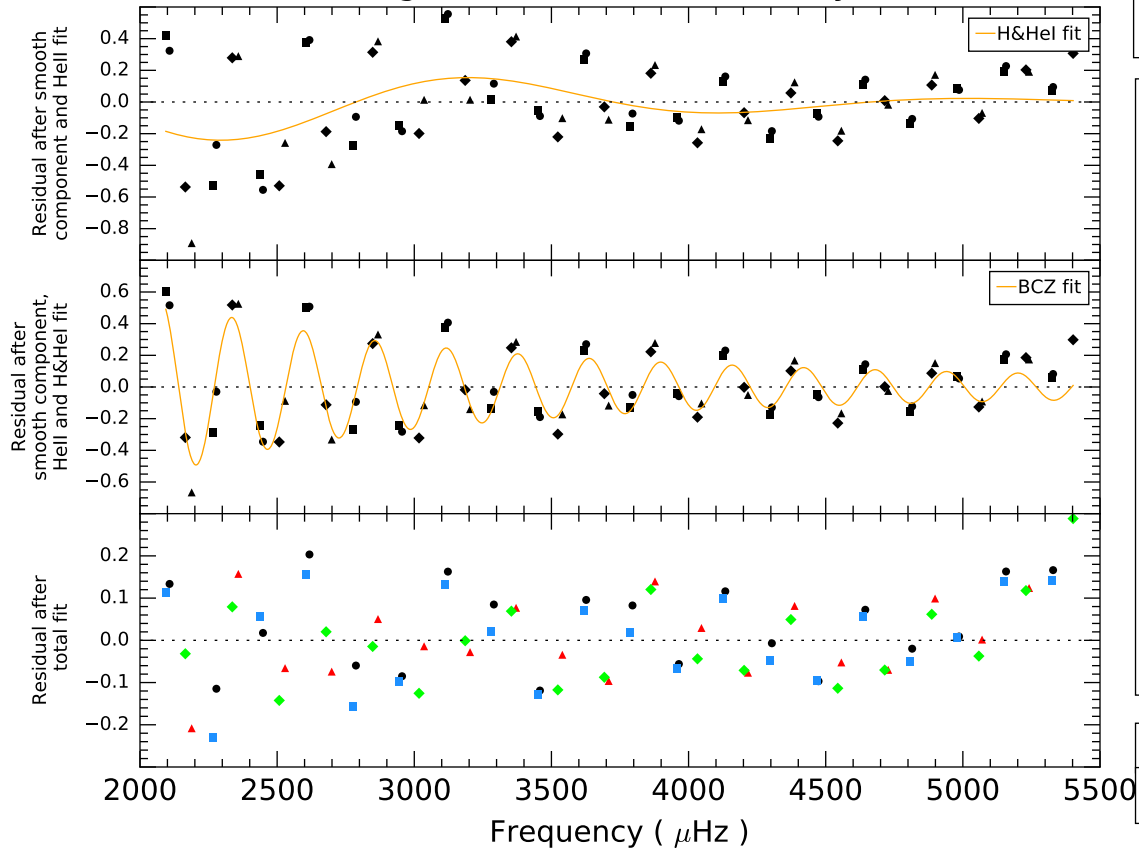
$$\tau_{\text{HI}} = 122.59 \text{ s}$$

$$\phi_{\text{HI}} = 2.6808$$

profile53

$$\chi^2_{\nu}(\text{dof} = 65) = 0.013497$$

Age after ZAMS: 12.610 Gyr



$$a_0 = -7.3088 \mu \text{ Hz}$$

$$a_1 = 0.0036606$$

$$a_2 = -4.3377e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0019704$$

$$c_2 = 2.501e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 523.63 \text{ s}$$

$$\phi_{\text{HeII}} = 4.5352$$

$$b_2 = 2.3948e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1919.2 \text{ s}$$

$$\phi_{\text{CZ}} = 1.7832$$

$$d_0 = 0.00023778$$

$$d_2 = 1.5419e-07 \mu\text{Hz}^{-2}$$

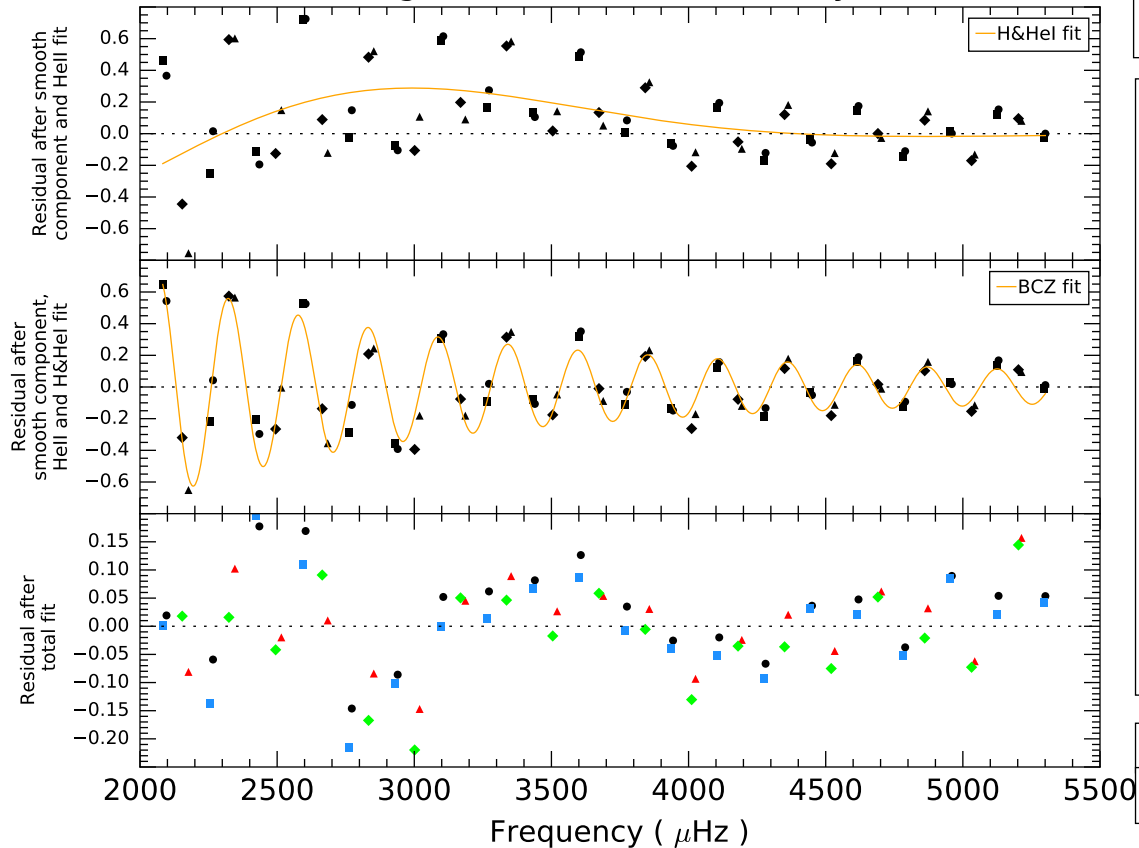
$$\tau_{\text{HI}} = 266.59 \text{ s}$$

$$\phi_{\text{HI}} = 3.2303$$

profile54

$$\chi^2_{\nu}(\text{dof} = 65) = 0.013066$$

# Age after ZAMS: 12.910 Gyr



$$a_0 = -7.438 \mu \text{ Hz}$$

$$a_1 = 0.0035871$$

$$a_2 = -4.1265e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.001547$$

$$c_2 = 2.3185e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 539.41 \text{ s}$$

$$\phi_{\text{HeII}} = 4.2864$$

$$b_2 = 3.016e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1962.2 \text{ s}$$

$$\phi_{\text{CZ}} = 0.84294$$

$$d_0 = 0.00068824$$

$$d_2 = 2.0317e-07 \mu\text{Hz}^{-2}$$

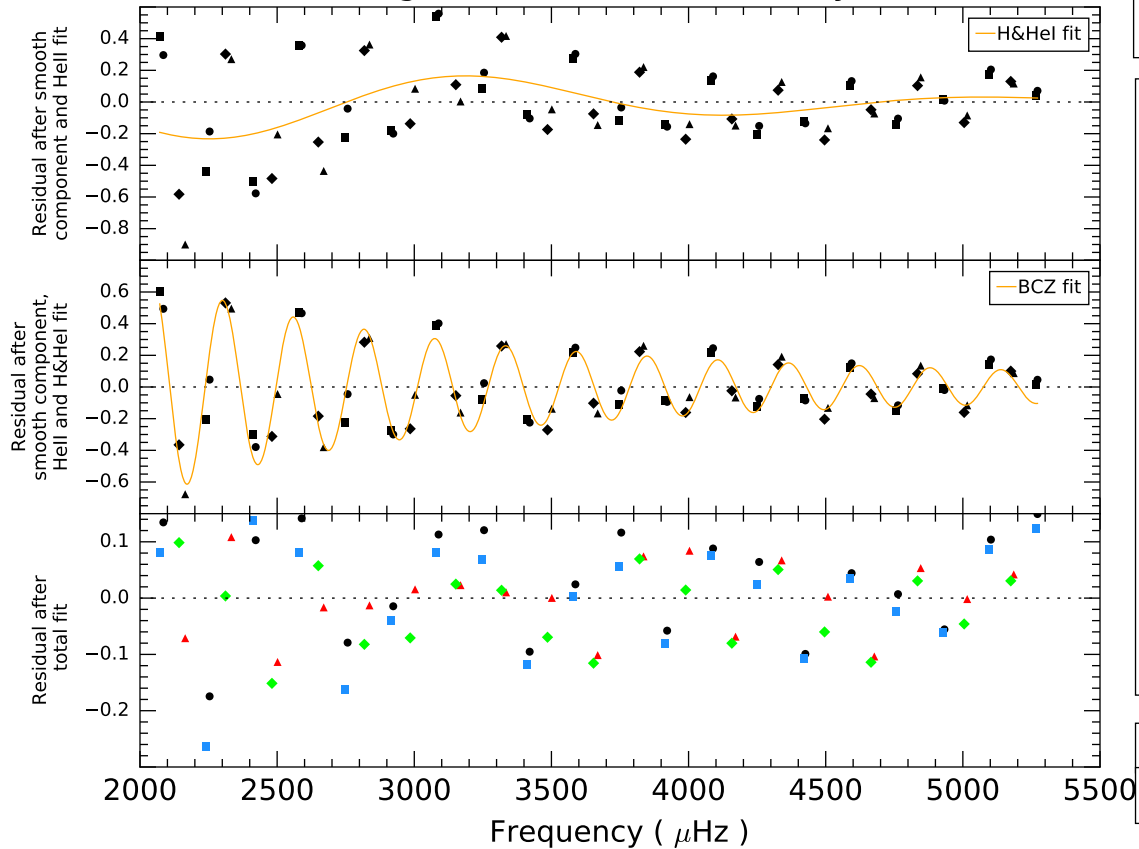
$$\tau_{\text{HI}} = 119.47 \text{ s}$$

$$\phi_{\text{HI}} = 2.8315$$

profile55

$$\chi^2_{\nu}(\text{dof} = 64) = 0.0088831$$

Age after ZAMS: 13.210 Gyr



$$a_0 = -7.1107 \mu \text{ Hz}$$

$$a_1 = 0.0035911$$

$$a_2 = -4.2824e-07 \mu \text{ Hz}^{-2}$$

$$c_0 = 0.0020853$$

$$c_2 = 2.6345e-07 \mu \text{ Hz}^{-2}$$

$$\tau_{\text{HeII}} = 532.96 \text{ s}$$

$$\phi_{\text{HeII}} = 4.4642$$

$$b_2 = 2.8972e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1938.6 \text{ s}$$

$$\phi_{\text{CZ}} = 2.0415$$

$$d_0 = 0.00020376$$

$$d_2 = 1.3354e-07 \mu \text{ Hz}^{-2}$$

$$\tau_{\text{HI}} = 257.88 \text{ s}$$

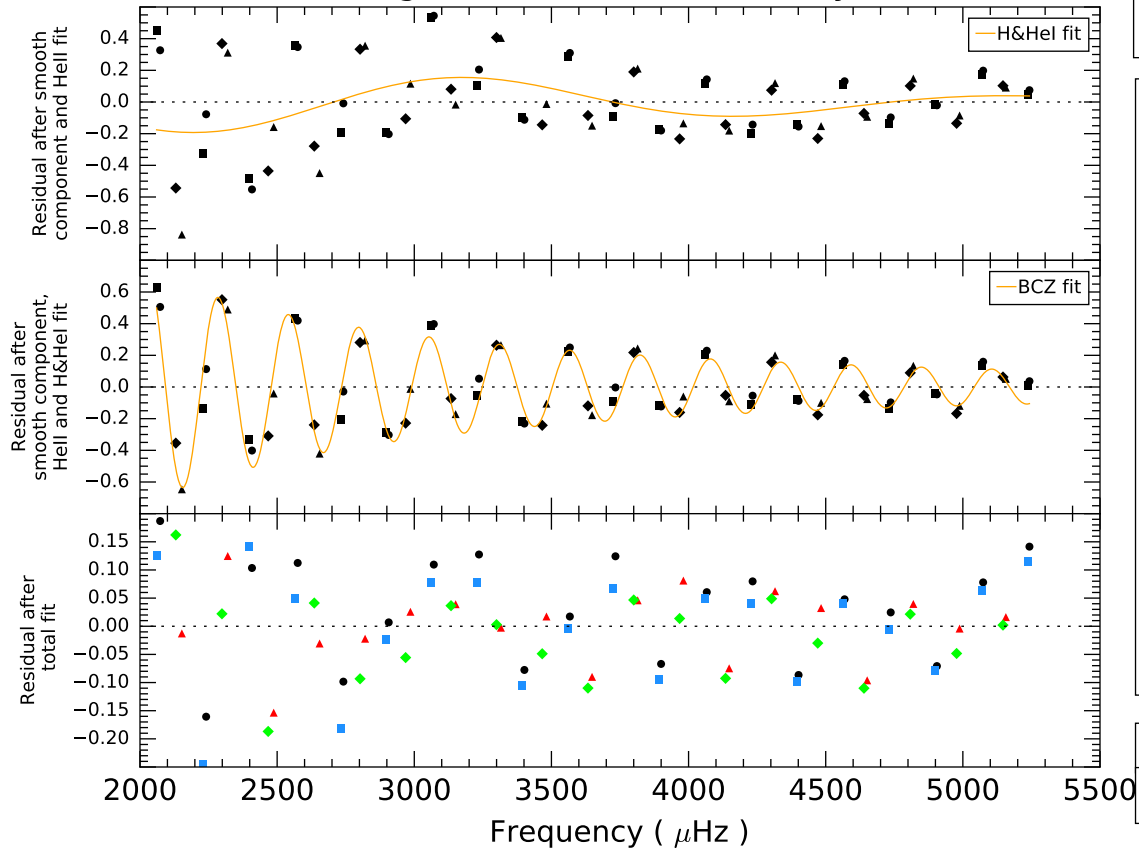
$$\phi_{\text{HI}} = 3.6469$$

profile56

$$\chi^2_{\nu}(\text{dof} = 64) = 0.0092121$$



# Age after ZAMS: 13.510 Gyr



$$a_0 = -7.1574 \mu \text{ Hz}$$

$$a_1 = 0.0036349$$

$$a_2 = -4.3569e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0019838$$

$$c_2 = 2.6071e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 542.31 \text{ s}$$

$$\phi_{\text{HeII}} = 4.2796$$

$$b_2 = 2.9542e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1950.1 \text{ s}$$

$$\phi_{\text{CZ}} = 2.1122$$

$$d_0 = 0.00014916$$

$$d_2 = 1.0992e-07 \mu\text{Hz}^{-2}$$

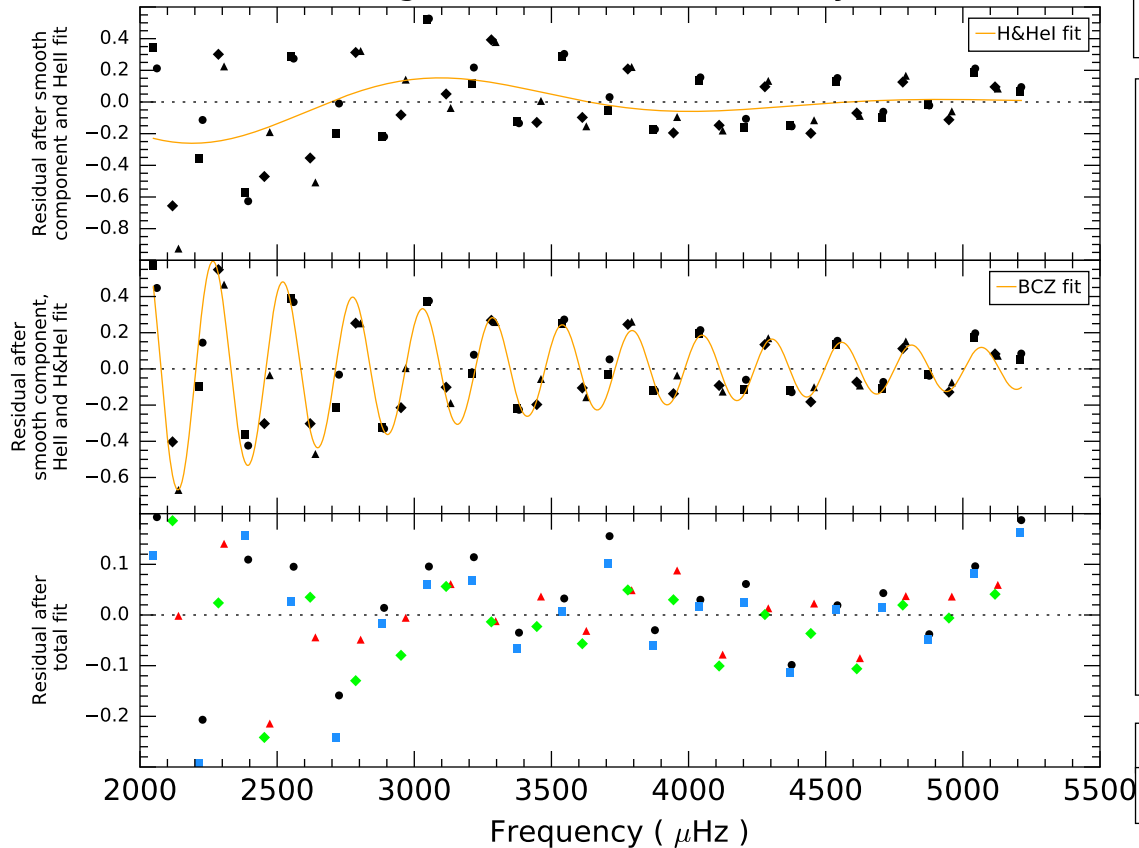
$$\tau_{\text{HI}} = 245.98 \text{ s}$$

$$\phi_{\text{HI}} = 4.205$$

profile57

$$\chi^2_{\nu}(\text{dof} = 64) = 0.009522$$

# Age after ZAMS: 13.810 Gyr



$$a_0 = -6.7562 \mu \text{ Hz}$$

$$a_1 = 0.0034674$$

$$a_2 = -4.1972e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0019859$$

$$c_2 = 2.6182e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 545.6 \text{ s}$$

$$\phi_{\text{HeII}} = 4.2995$$

$$b_2 = 3.057e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1963.5 \text{ s}$$

$$\phi_{\text{CZ}} = 2.1789$$

$$d_0 = 0.00028379$$

$$d_2 = 1.8006e-07 \mu\text{Hz}^{-2}$$

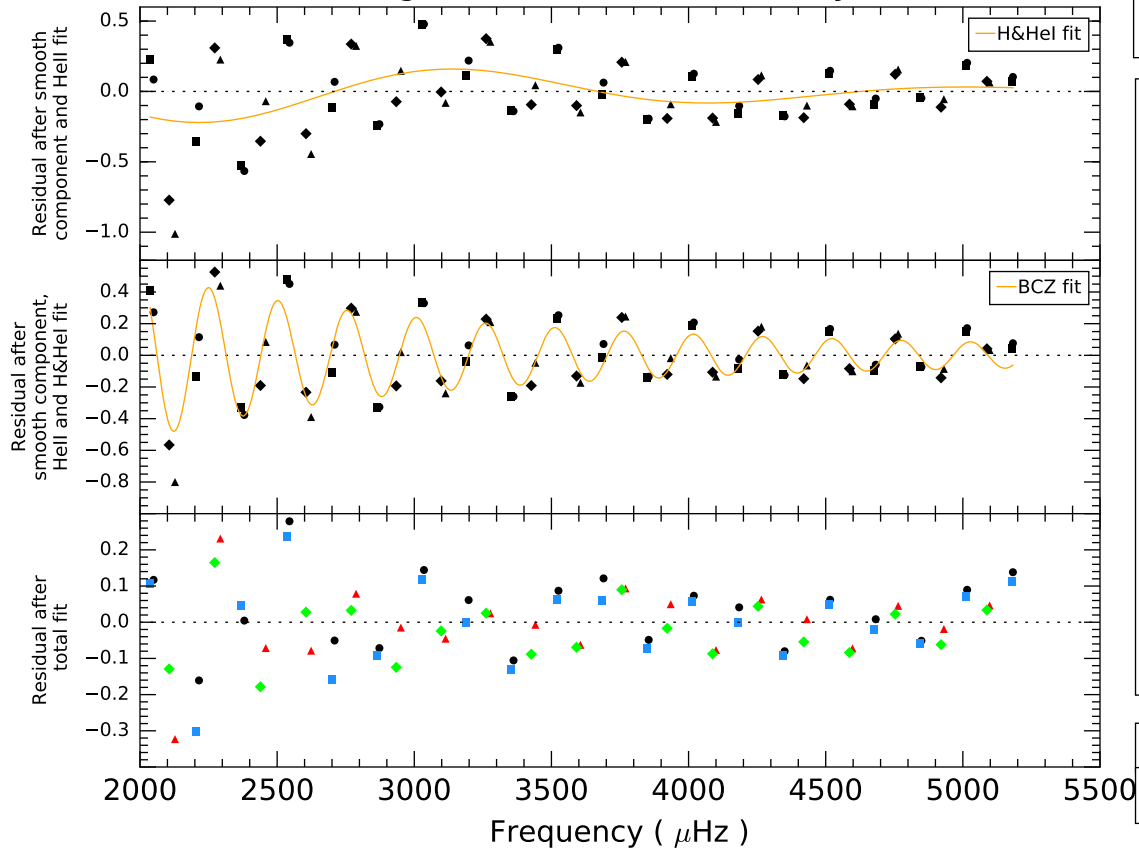
$$\tau_{\text{HI}} = 264.85 \text{ s}$$

$$\phi_{\text{HI}} = 3.6055$$

profile58

$$\chi^2_{\nu}(\text{dof} = 64) = 0.011838$$

# Age after ZAMS: 14.110 Gyr



$$a_0 = -6.8607 \mu \text{ Hz}$$

$$a_1 = 0.003544$$

$$a_2 = -4.3161e-07 \mu \text{ Hz}^{-2}$$

$$c_0 = 0.0018616$$

$$c_2 = 2.5468e-07 \mu \text{ Hz}^{-2}$$

$$\tau_{\text{HeII}} = 548.44 \text{ s}$$

$$\phi_{\text{HeII}} = 4.4286$$

$$b_2 = 2.1659e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 1980.5 \text{ s}$$

$$\phi_{\text{CZ}} = 2.0948$$

$$d_0 = 0.00019258$$

$$d_2 = 1.3404e-07 \mu \text{ Hz}^{-2}$$

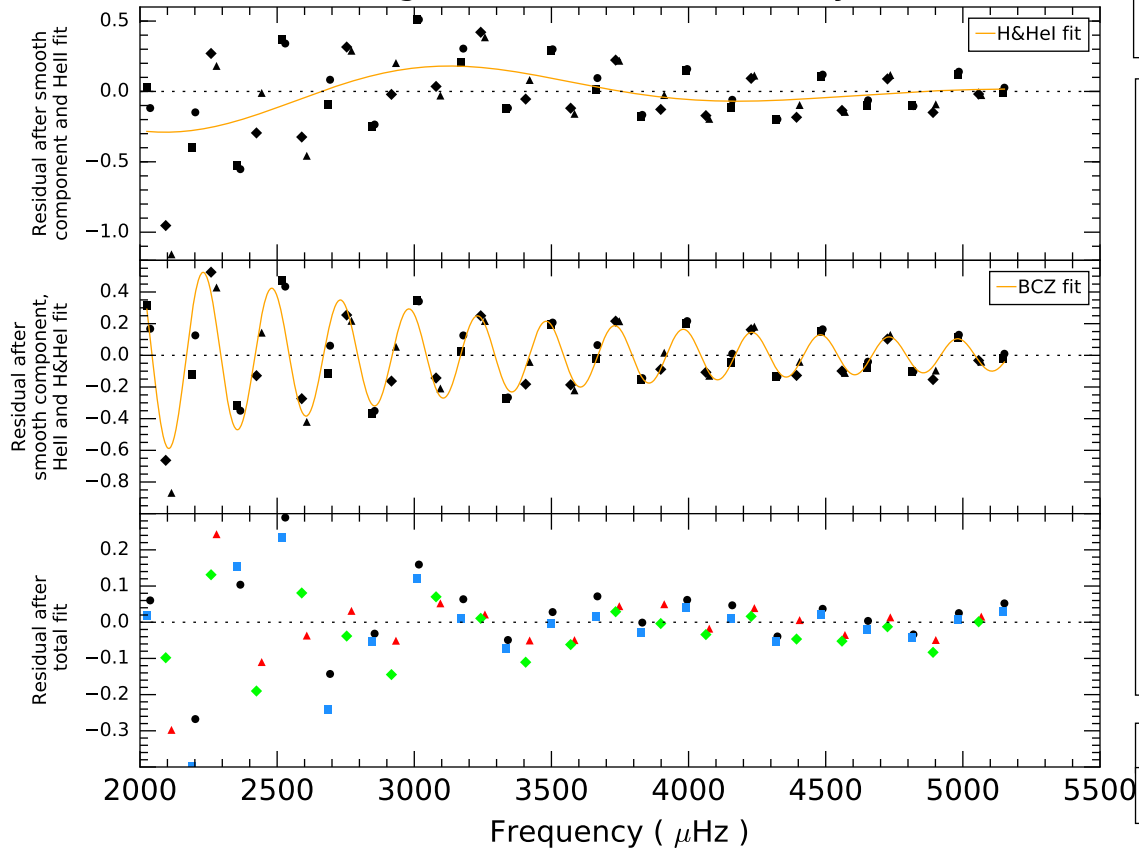
$$\tau_{\text{HI}} = 260.69 \text{ s}$$

$$\phi_{\text{HI}} = 3.6949$$

profile59

$$\chi^2_{\nu}(\text{dof} = 64) = 0.01343$$

# Age after ZAMS: 14.410 Gyr



$$a_0 = -6.3191 \mu \text{ Hz}$$

$$a_1 = 0.0032438$$

$$a_2 = -3.9157e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0019726$$

$$c_2 = 2.6982e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 543.6 \text{ s}$$

$$\phi_{\text{HeII}} = 4.7509$$

$$b_2 = 2.6089e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 2000.0 \text{ s}$$

$$\phi_{\text{CZ}} = 2.0358$$

$$d_0 = 0.00027594$$

$$d_2 = 1.5713e-07 \mu\text{Hz}^{-2}$$

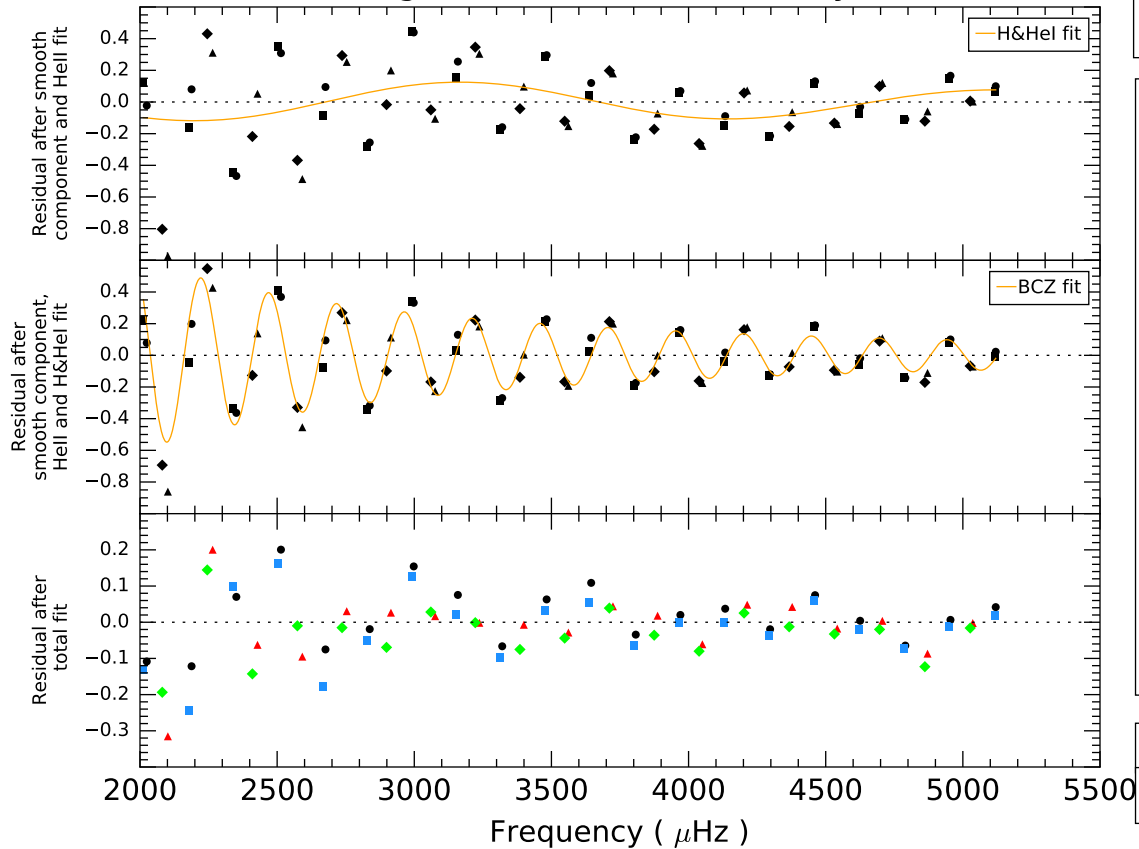
$$\tau_{\text{HI}} = 228.29 \text{ s}$$

$$\phi_{\text{HI}} = 4.9346$$

profile60

$$\chi^2_{\nu}(\text{dof} = 64) = 0.013772$$

# Age after ZAMS: 14.710 Gyr



$$a_0 = -6.7942 \mu \text{ Hz}$$

$$a_1 = 0.003558$$

$$a_2 = -4.3818e-07 \mu\text{Hz}^{-1}$$

$$c_0 = 0.0014785$$

$$c_2 = 2.3556e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 559.32 \text{ s}$$

$$\phi_{\text{HeII}} = 4.3822$$

$$b_2 = 2.4145e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 2022.2 \text{ s}$$

$$\phi_{\text{CZ}} = 1.6345$$

$$d_0 = 7.1896e-05$$

$$d_2 = 5.946e-08 \mu\text{Hz}^{-2}$$

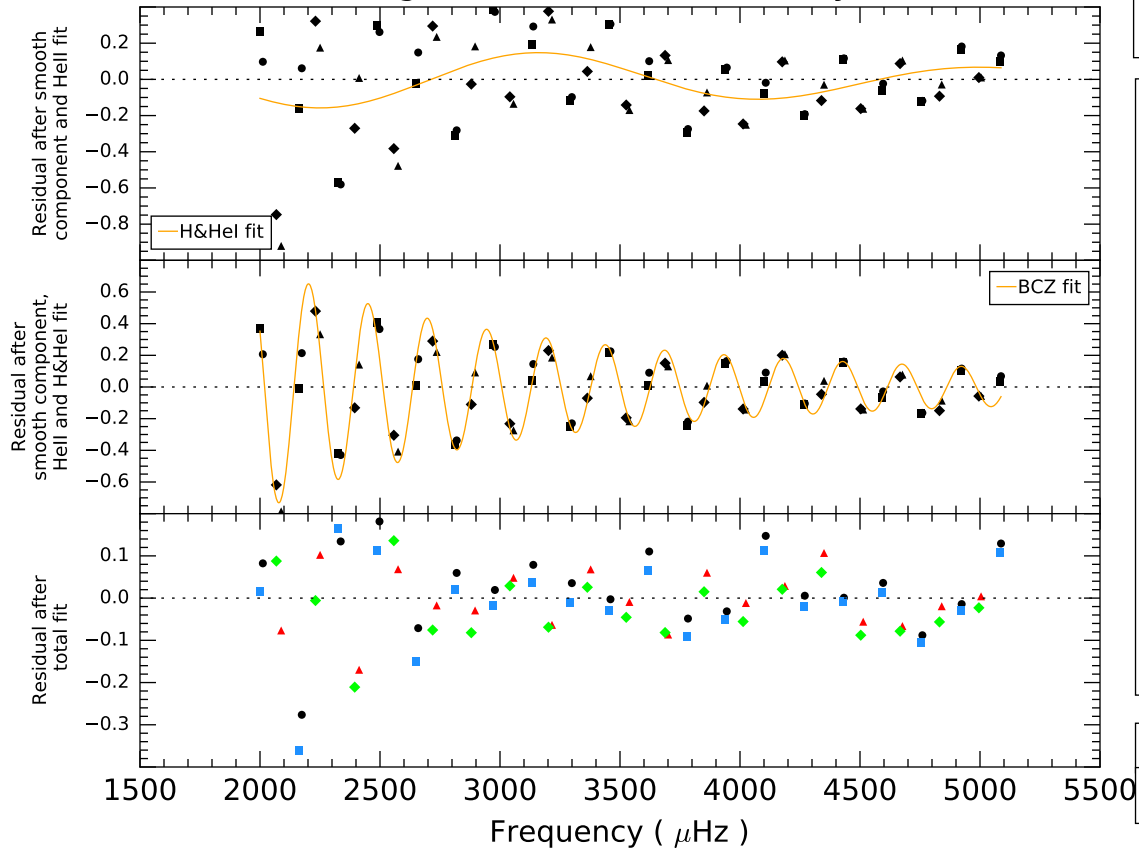
$$\tau_{\text{HI}} = 251.25 \text{ s}$$

$$\phi_{\text{HI}} = 4.1196$$

profile61

$$\chi^2_{\nu}(\text{dof} = 64) = 0.0097922$$

Age after ZAMS: 15.010 Gyr



$$a_0 = -6.6539 \mu \text{ Hz}$$

$$a_1 = 0.003519$$

$$a_2 = -4.3759e-07 \mu\text{Hz}^{-1}$$

$$c_0 = 0.0019052$$

$$c_2 = 2.6787e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 581.94 \text{ s}$$

$$\phi_{\text{HeII}} = 3.8125$$

$$b_2 = 3.1616e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 2022.6 \text{ s}$$

$$\phi_{\text{CZ}} = 2.1117$$

$$d_0 = 0.00010633$$

$$d_2 = 8.2089e-08 \mu\text{Hz}^{-2}$$

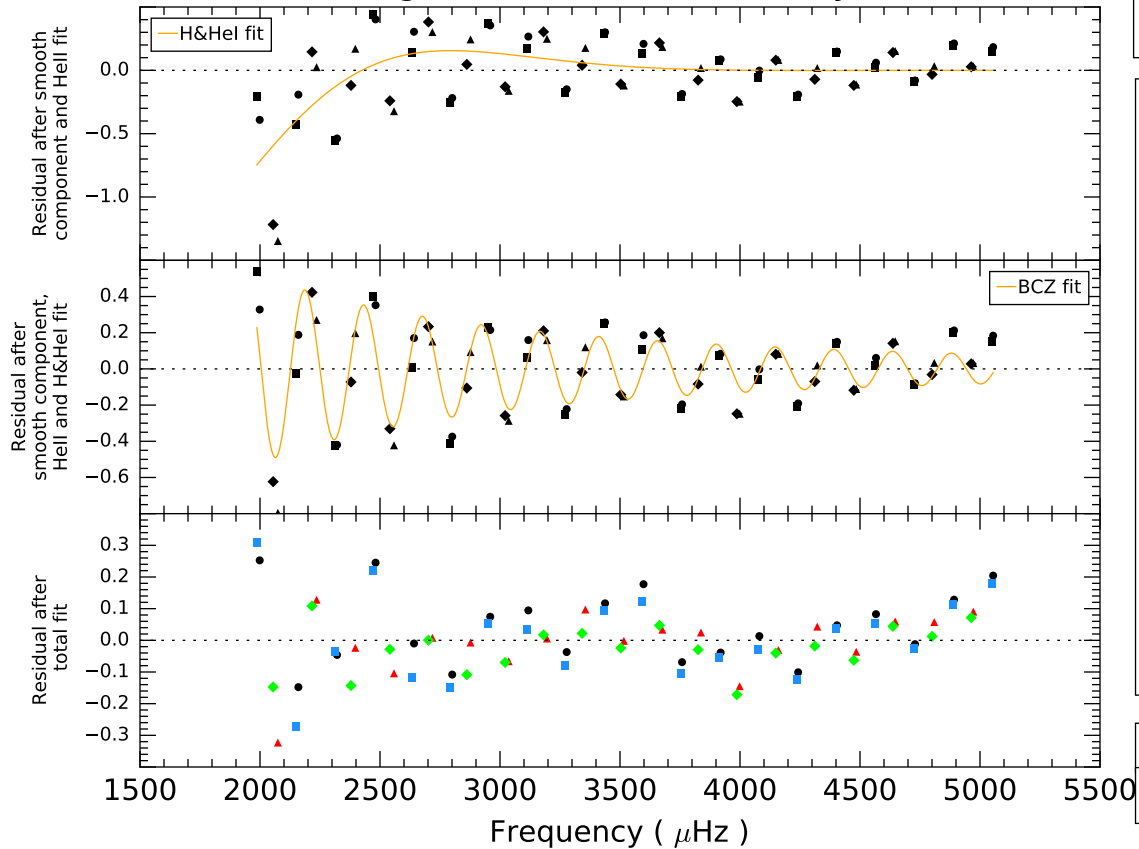
$$\tau_{\text{HI}} = 267.4 \text{ s}$$

$$\phi_{\text{HI}} = 3.4588$$

profile62

$$\chi^2_{\nu}(\text{dof} = 64) = 0.010598$$

Age after ZAMS: 15.310 Gyr



$$a_0 = -6.5233 \mu \text{ Hz}$$

$$a_1 = 0.0034768$$

$$a_2 = -4.3737e-07 \mu\text{Hz}^{-1}$$

$$c_0 = 0.0020541$$

$$c_2 = 2.6324e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 555.9 \text{ s}$$

$$\phi_{\text{HeII}} = 4.9331$$

$$b_2 = 2.0883e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 2042.2 \text{ s}$$

$$\phi_{\text{CZ}} = 1.9674$$

$$d_0 = 0.0031159$$

$$d_2 = 4.6035e-07 \mu\text{Hz}^{-2}$$

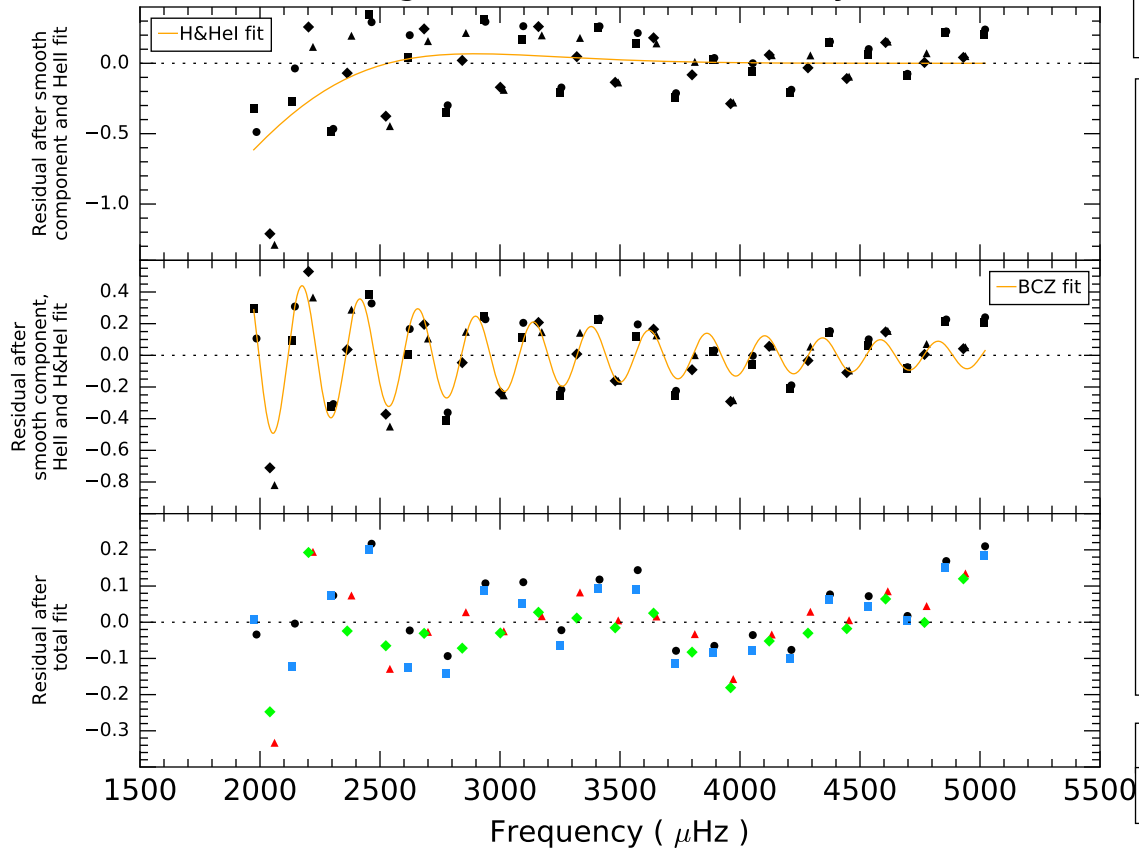
$$\tau_{\text{HI}} = 152.2 \text{ s}$$

$$\phi_{\text{HI}} = 1.6473$$

profile63

$$\chi^2_{\nu}(\text{dof} = 64) = 0.015318$$

Age after ZAMS: 15.610 Gyr



- $\ell = 0$
- ▲  $\ell = 1$
- $\ell = 2$
- ◆  $\ell = 3$

$$a_0 = -6.4119 \mu \text{ Hz}$$

$$a_1 = 0.0034946$$

$$a_2 = -4.483e-07 \mu \text{ Hz}^{-1}$$

$$c_0 = 0.0015744$$

$$c_2 = 2.4161e-07 \mu \text{ Hz}^{-2}$$

$$\tau_{\text{HeII}} = 562.19 \text{ s}$$

$$\phi_{\text{HeII}} = 4.9044$$

$$b_2 = 2.081e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 2075.6 \text{ s}$$

$$\phi_{\text{CZ}} = 1.3522$$

$$d_0 = 0.003042$$

$$d_2 = 4.934e-07 \mu \text{ Hz}^{-2}$$

$$\tau_{\text{HI}} = 110.27 \text{ s}$$

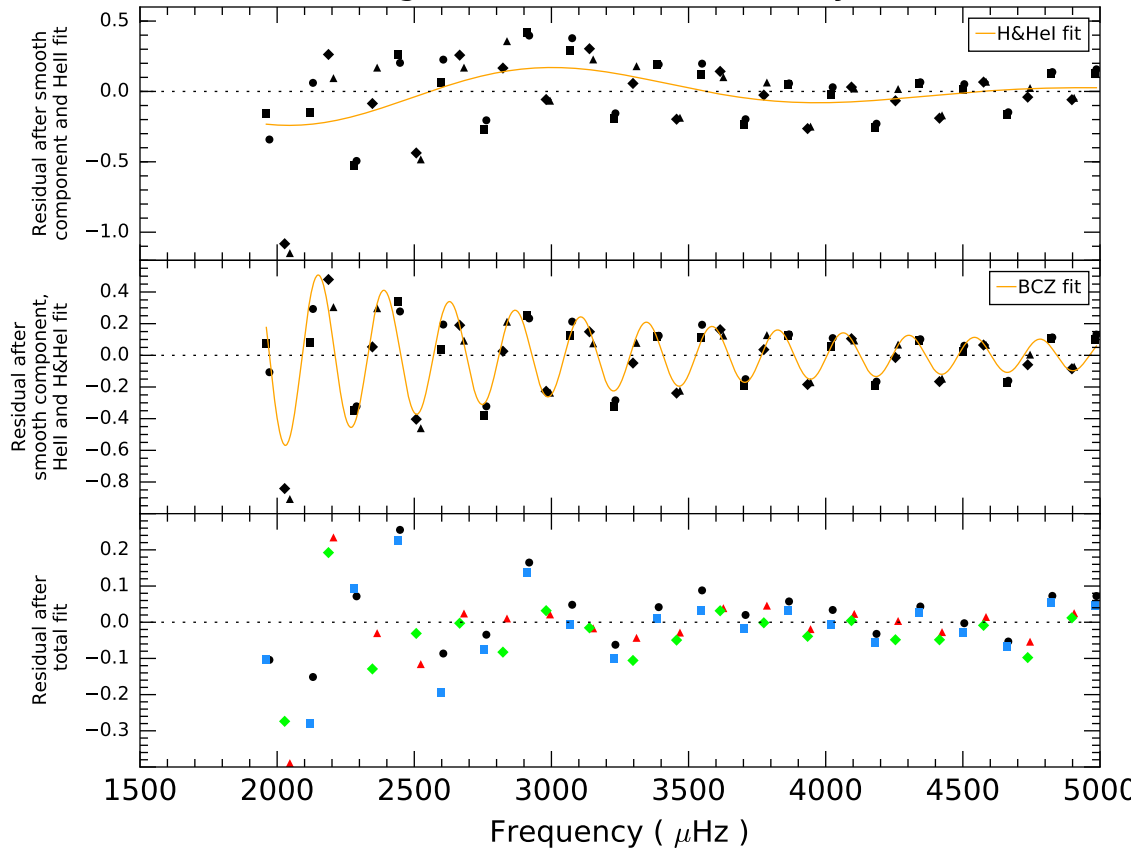
$$\phi_{\text{HI}} = 2.7728$$

profile64

$$\chi^2_{\nu}(\text{dof} = 64) = 0.013432$$



# Age after ZAMS: 15.910 Gyr



$$a_0 = -6.3332 \mu\text{Hz}$$

$$a_1 = 0.0034216$$

$$a_2 = -4.3415e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.001976$$

$$c_2 = 2.8371e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 566.86 \text{ s}$$

$$\phi_{\text{HeII}} = 4.8038$$

$$b_2 = 2.3465e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 2090.4 \text{ s}$$

$$\phi_{\text{CZ}} = 1.6129$$

$$d_0 = 0.0002197$$

$$d_2 = 1.4859e-07 \mu\text{Hz}^{-2}$$

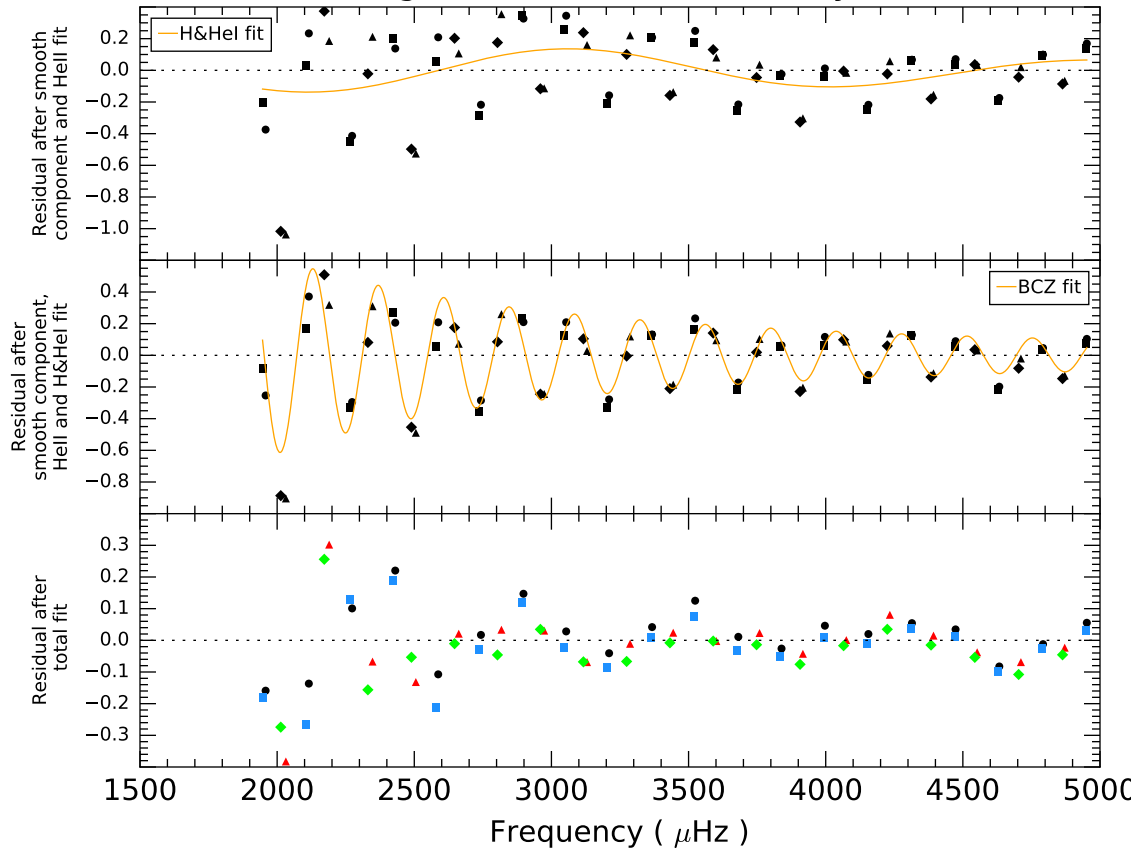
$$\tau_{\text{HI}} = 249.11 \text{ s}$$

$$\phi_{\text{HI}} = 4.5614$$

profile65

$$\chi^2_{\nu}(\text{dof} = 64) = 0.012733$$

# Age after ZAMS: 16.210 Gyr



$$a_0 = -6.2528 \mu \text{ Hz}$$

$$a_1 = 0.0034193$$

$$a_2 = -4.3814e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0013798$$

$$c_2 = 2.3925e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 577.9 \text{ s}$$

$$\phi_{\text{HeII}} = 4.6422$$

$$b_2 = 2.4822e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 2096.9 \text{ s}$$

$$\phi_{\text{CZ}} = 1.9606$$

$$d_0 = 9.2547e-05$$

$$d_2 = 7.8237e-08 \mu\text{Hz}^{-2}$$

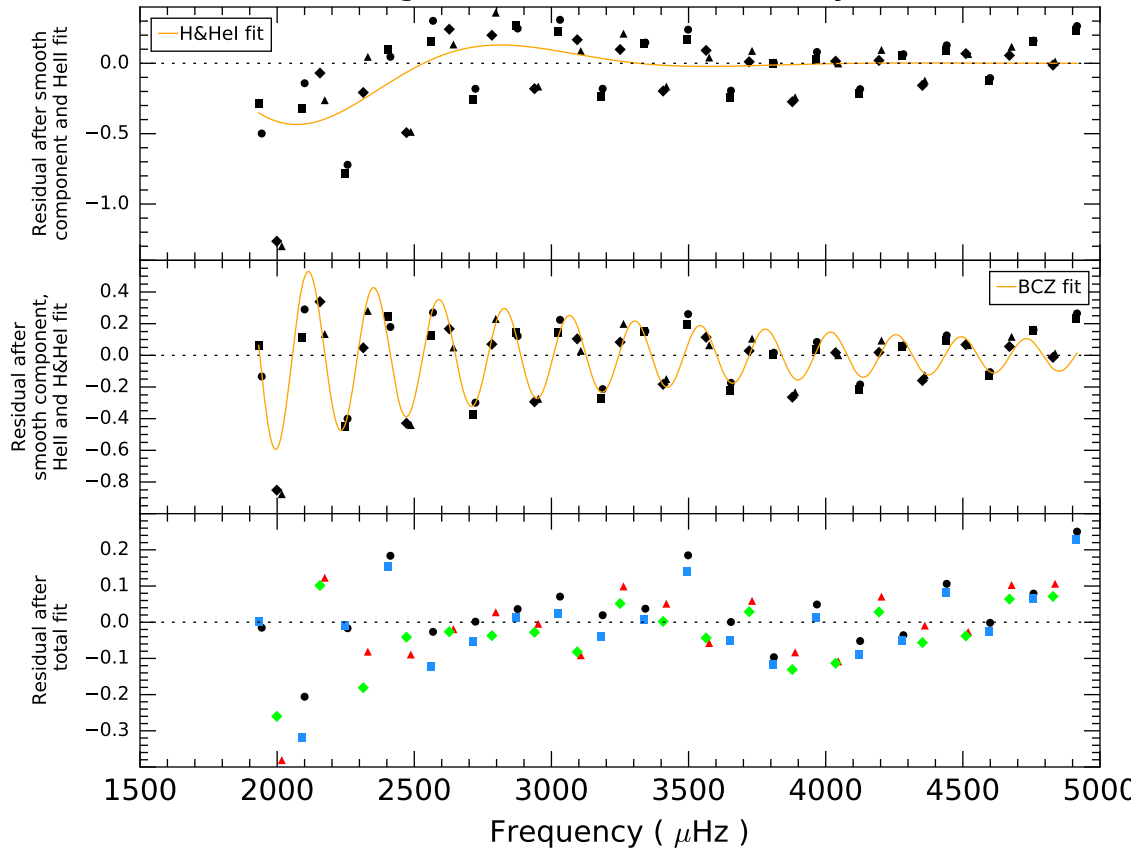
$$\tau_{\text{HI}} = 255.93 \text{ s}$$

$$\phi_{\text{HI}} = 4.2461$$

profile66

$$\chi^2_{\nu}(\text{dof} = 64) = 0.014188$$

# Age after ZAMS: 16.510 Gyr



$$a_0 = -5.8745 \mu \text{ Hz}$$

$$a_1 = 0.0033026$$

$$a_2 = -4.3467e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0024033$$

$$c_2 = 2.9878e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 583.41 \text{ s}$$

$$\phi_{\text{HeII}} = 4.6081$$

$$b_2 = 2.3677e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 2101.5 \text{ s}$$

$$\phi_{\text{CZ}} = 2.2661$$

$$d_0 = 0.0012186$$

$$d_2 = 4.0022e-07 \mu\text{Hz}^{-2}$$

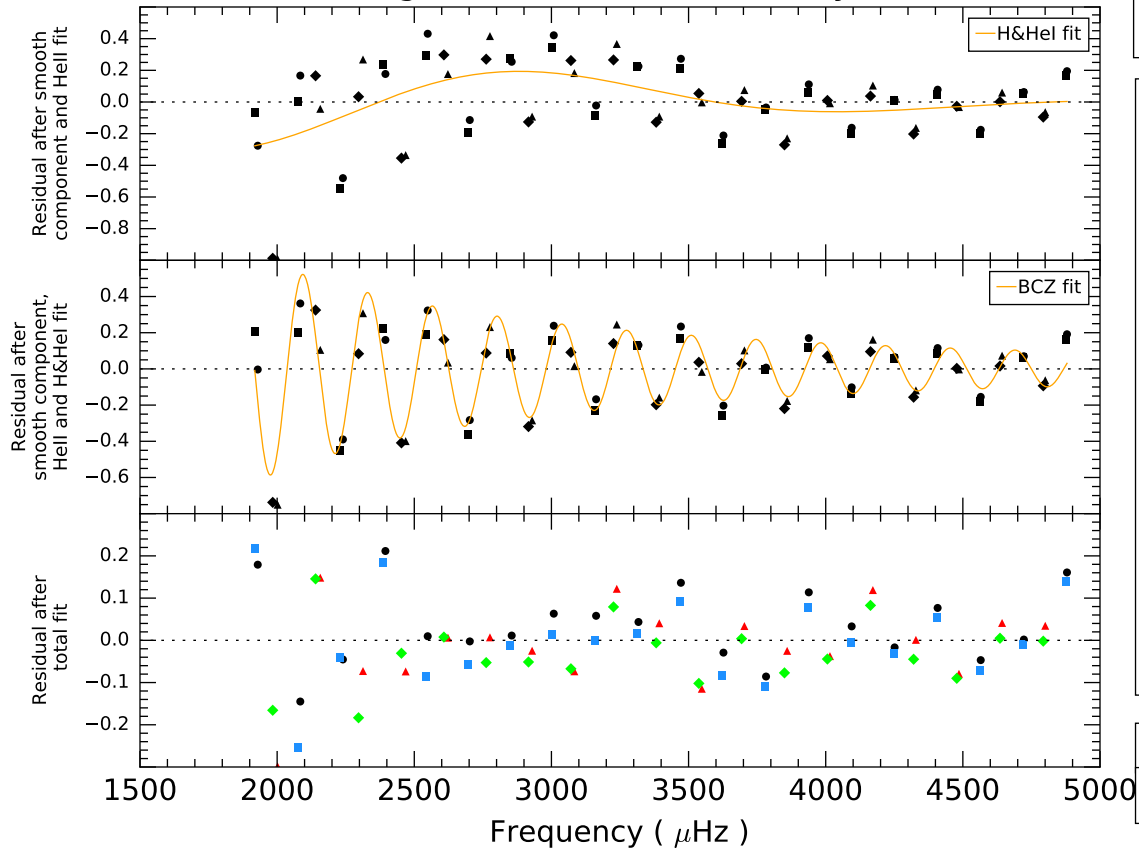
$$\tau_{\text{HI}} = 319.54 \text{ s}$$

$$\phi_{\text{HI}} = 2.3941$$

profile67

$$\chi^2_{\nu}(\text{dof} = 64) = 0.01397$$

# Age after ZAMS: 16.810 Gyr



$$a_0 = -6.2121 \mu \text{ Hz}$$

$$a_1 = 0.0034119$$

$$a_2 = -4.4066e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0020755$$

$$c_2 = 2.8487e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 606.17 \text{ s}$$

$$\phi_{\text{HeII}} = 4.14$$

$$b_2 = 2.2908e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 2119.0 \text{ s}$$

$$\phi_{\text{CZ}} = 2.3348$$

$$d_0 = 0.00030237$$

$$d_2 = 1.7704e-07 \mu\text{Hz}^{-2}$$

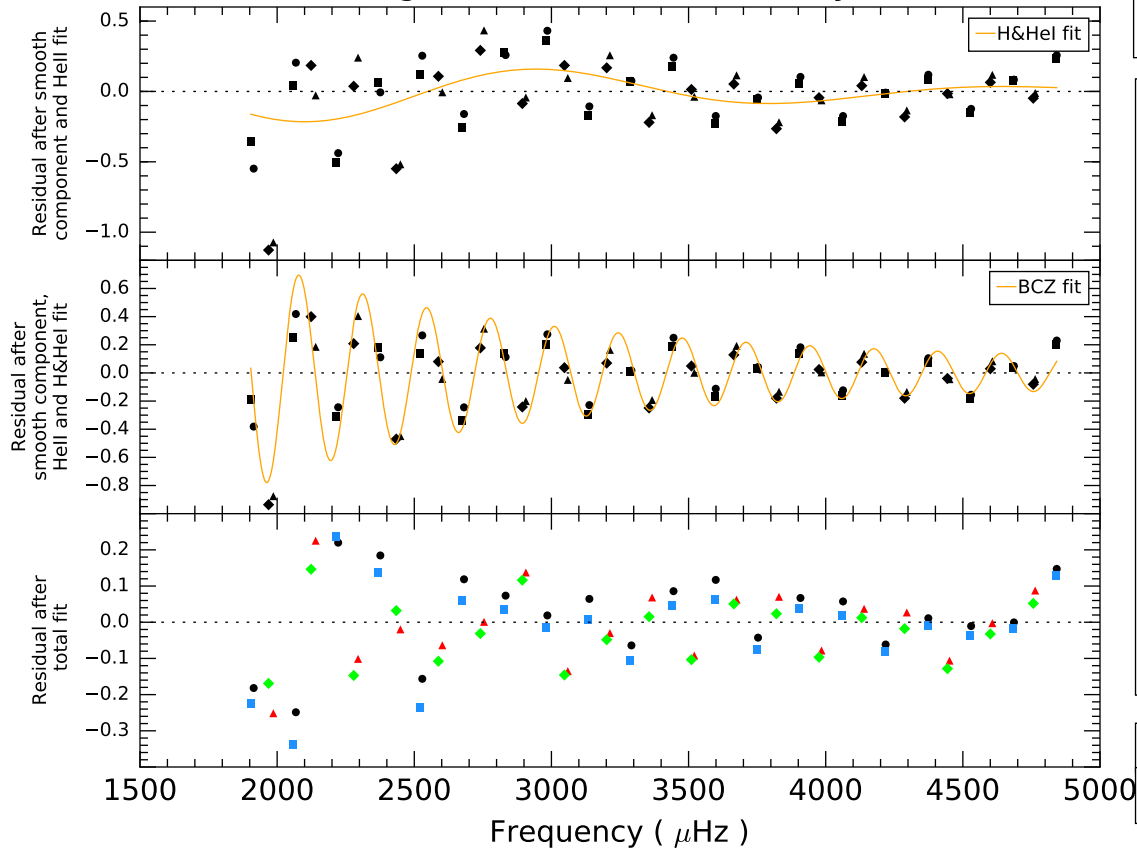
$$\tau_{\text{HI}} = 203.88 \text{ s}$$

$$\phi_{\text{HI}} = 0.21239$$

profile68

$$\chi^2_{\nu}(\text{dof} = 64) = 0.011337$$

# Age after ZAMS: 17.110 Gyr



$$a_0 = -6.0026 \mu \text{ Hz}$$

$$a_1 = 0.003403$$

$$a_2 = -4.5172e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0019761$$

$$c_2 = 3.0408e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 595.61 \text{ s}$$

$$\phi_{\text{HeII}} = 4.6384$$

$$b_2 = 3.0029e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 2147.1 \text{ s}$$

$$\phi_{\text{CZ}} = 1.9997$$

$$d_0 = 0.00019793$$

$$d_2 = 1.4866e-07 \mu\text{Hz}^{-2}$$

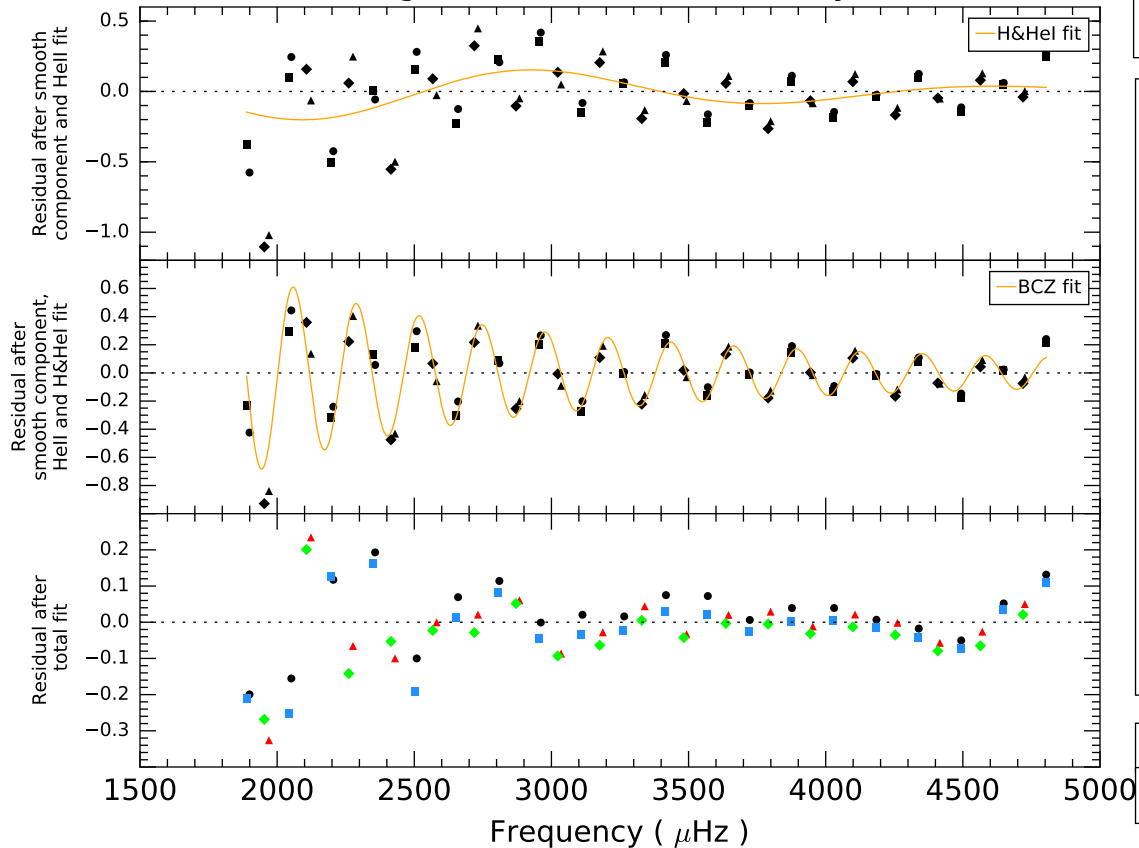
$$\tau_{\text{HI}} = 286.26 \text{ s}$$

$$\phi_{\text{HI}} = 3.4016$$

profile69

$$\chi^2_{\nu}(\text{dof} = 64) = 0.01593$$

# Age after ZAMS: 17.410 Gyr



$$a_0 = -5.923 \mu \text{ Hz}$$

$$a_1 = 0.0033963$$

$$a_2 = -4.5571e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0018612$$

$$c_2 = 2.9562e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 604.76 \text{ s}$$

$$\phi_{\text{HeII}} = 4.5536$$

$$b_2 = 2.5836e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 2179.8 \text{ s}$$

$$\phi_{\text{CZ}} = 1.6996$$

$$d_0 = 0.00018078$$

$$d_2 = 1.4358e-07 \mu\text{Hz}^{-2}$$

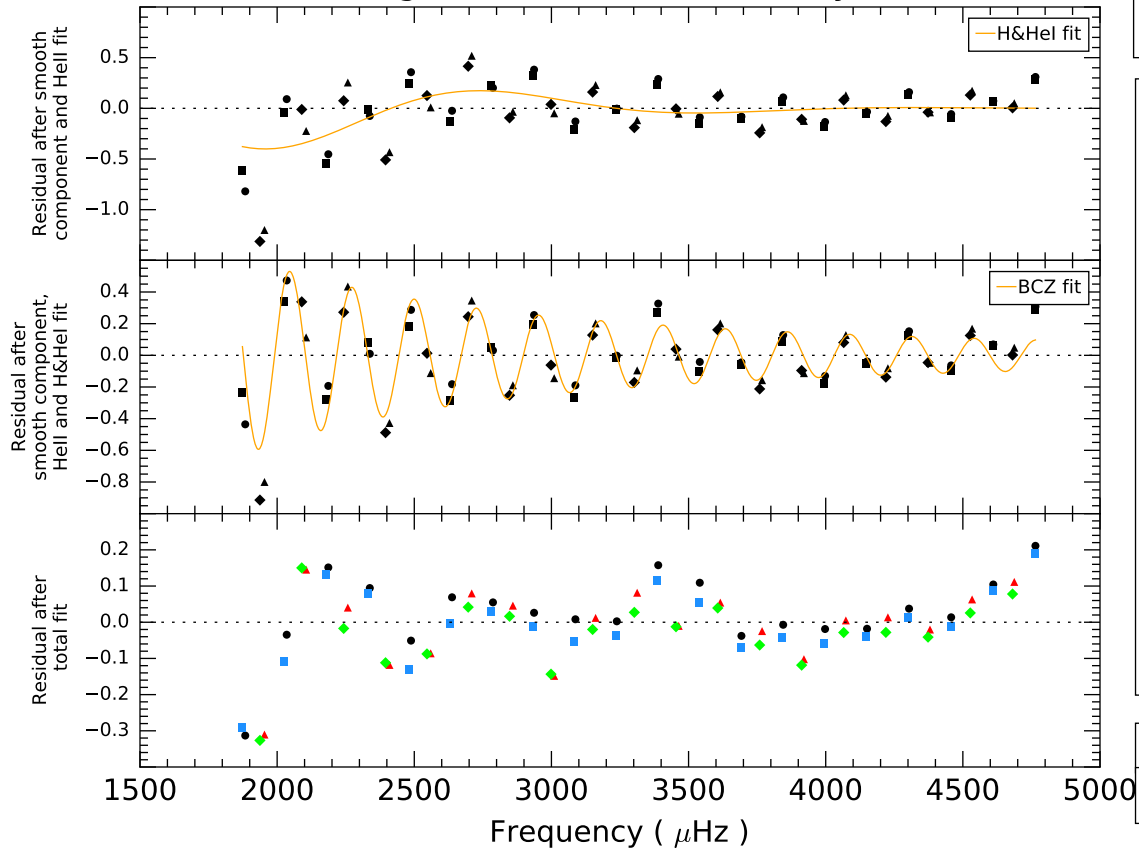
$$\tau_{\text{HI}} = 289.51 \text{ s}$$

$$\phi_{\text{HI}} = 3.3552$$

profile70

$$\chi^2_{\nu}(\text{dof} = 64) = 0.011993$$

# Age after ZAMS: 17.710 Gyr



$$a_0 = -5.8908 \mu \text{ Hz}$$

$$a_1 = 0.003433$$

$$a_2 = -4.685e-07 \mu \text{ Hz}^{-1}$$

$$c_0 = 0.0023765$$

$$c_2 = 3.2522e-07 \mu \text{ Hz}^{-2}$$

$$\tau_{\text{HeII}} = 590.05 \text{ s}$$

$$\phi_{\text{HeII}} = 5.1715$$

$$b_2 = 2.2182e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 2204.4 \text{ s}$$

$$\phi_{\text{CZ}} = 1.4241$$

$$d_0 = 0.00067654$$

$$d_2 = 3.0779e-07 \mu \text{ Hz}^{-2}$$

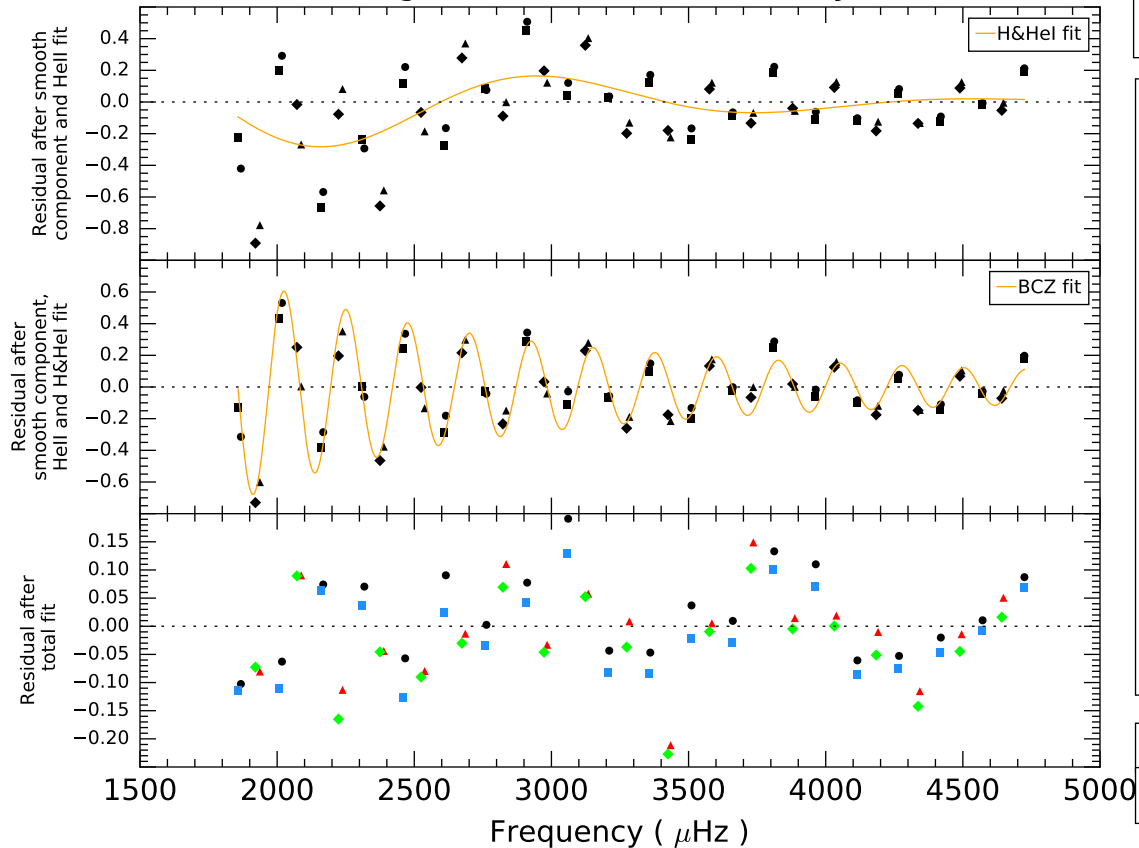
$$\tau_{\text{HI}} = 304.27 \text{ s}$$

$$\phi_{\text{HI}} = 3.3342$$

profile71

$$\chi^2_{\nu}(\text{dof} = 64) = 0.013514$$

# Age after ZAMS: 18.010 Gyr



$$a_0 = -4.9109 \mu \text{ Hz}$$

$$a_1 = 0.0028861$$

$$a_2 = -3.9388e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0017417$$

$$c_2 = 2.9889e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 672.34 \text{ s}$$

$$\phi_{\text{HeII}} = 2.9259$$

$$b_2 = 2.4824e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 2219.4 \text{ s}$$

$$\phi_{\text{CZ}} = 1.6177$$

$$d_0 = 0.00034627$$

$$d_2 = 2.0707e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HI}} = 305.75 \text{ s}$$

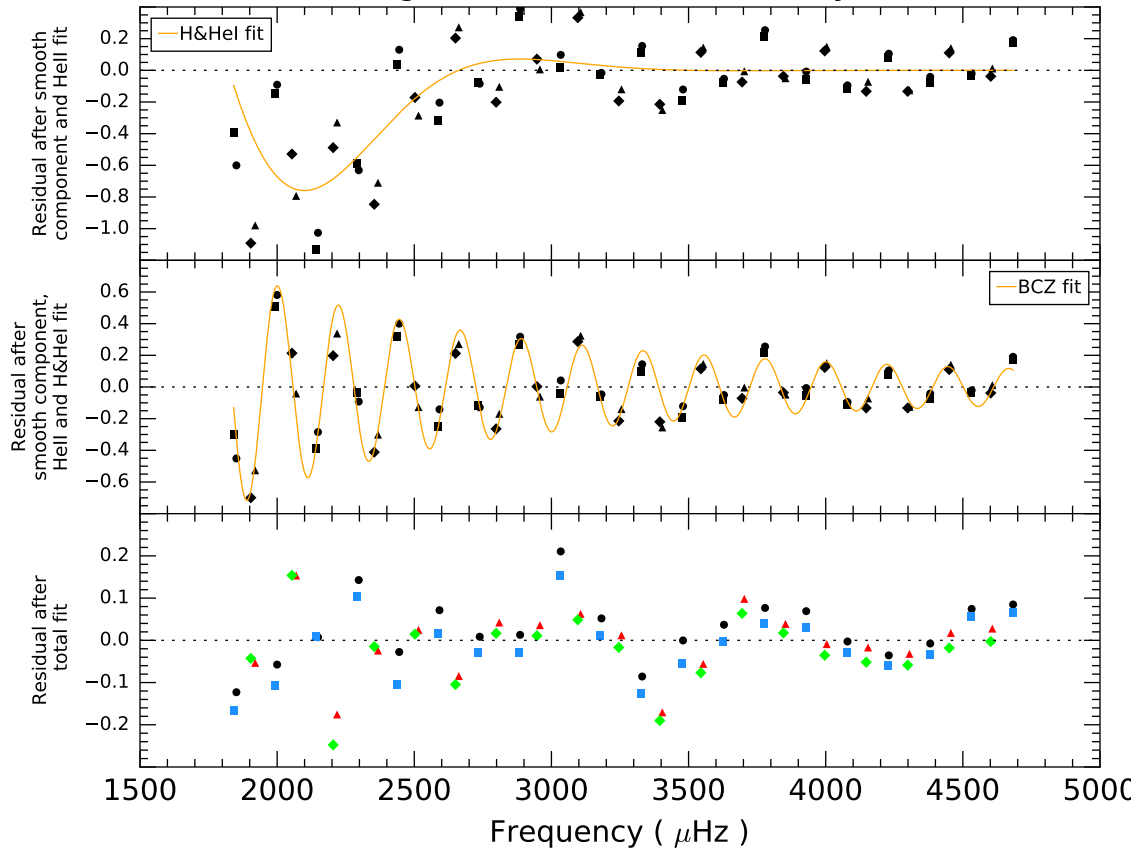
$$\phi_{\text{HI}} = 2.5923$$

profile72

$$\chi^2_{\nu}(\text{dof} = 64) = 0.0083038$$



# Age after ZAMS: 18.310 Gyr



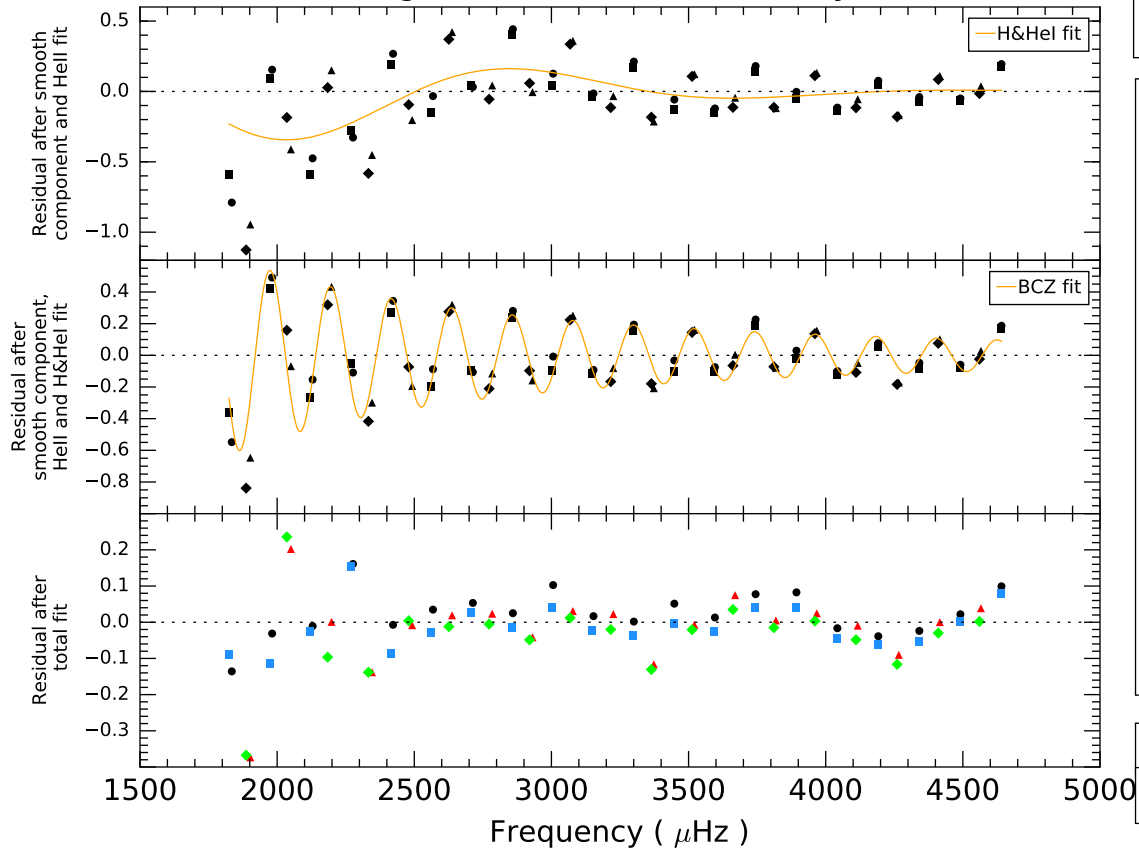
- $\bullet$   $\ell=0$
- $\blacktriangle$   $\ell=1$
- $\blacksquare$   $\ell=2$
- $\blacklozenge$   $\ell=3$

$$\begin{aligned}
 a_0 &= -3.3472 \mu \text{ Hz} \\
 a_1 &= 0.0021121 \\
 a_2 &= -3.0111e-07 \mu \text{ Hz}^{-2} \\
 c_0 &= 0.0021551 \\
 c_2 &= 3.2097e-07 \mu \text{ Hz}^{-2} \\
 \tau_{\text{HeII}} &= 690.62 \text{ s} \\
 \phi_{\text{HeII}} &= 2.4902 \\
 b_2 &= 2.5581e+06 \text{ mHz}^3 \\
 \tau_{\text{CZ}} &= 2250.7 \text{ s} \\
 \phi_{\text{CZ}} &= 1.4986 \\
 d_0 &= 0.0073431 \\
 d_2 &= 6.4843e-07 \mu \text{ Hz}^{-2} \\
 \tau_{\text{HI}} &= 298.77 \text{ s} \\
 \phi_{\text{HI}} &= 2.575
 \end{aligned}$$

profile73

$$\chi^2_{\nu}(\text{dof} = 64) = 0.008138$$

# Age after ZAMS: 18.610 Gyr



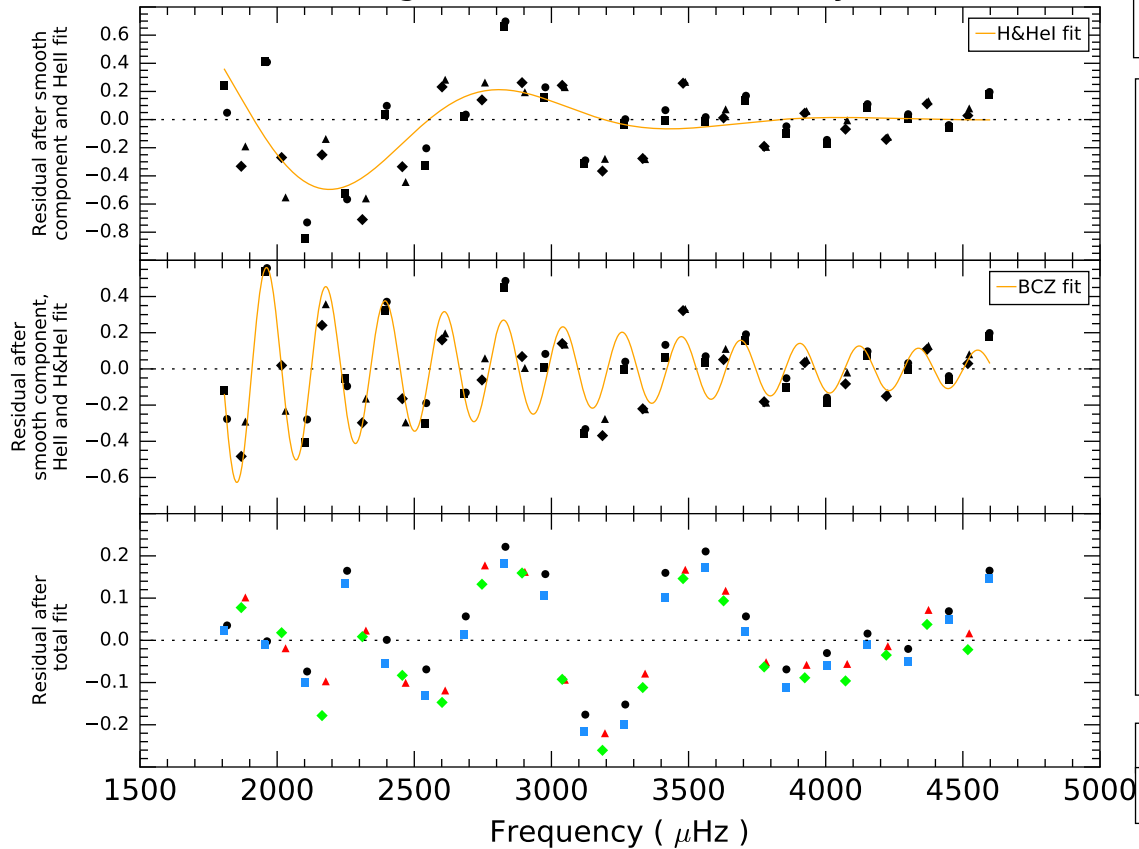
- $\bullet$   $\ell = 0$
- $\blacktriangle$   $\ell = 1$
- $\blacksquare$   $\ell = 2$
- $\blacklozenge$   $\ell = 3$

$$\begin{aligned}
 a_0 &= -4.6903 \mu \text{ Hz} \\
 a_1 &= 0.0028287 \\
 a_2 &= -3.9544e-07 \mu \text{ Hz}^{-2} \\
 c_0 &= 0.0020279 \\
 c_2 &= 3.2387e-07 \mu \text{ Hz}^{-2} \\
 \tau_{\text{HeII}} &= 658.9 \text{ s} \\
 \phi_{\text{HeII}} &= 3.8195 \\
 b_2 &= 2.0911e+06 \text{ mHz}^3 \\
 \tau_{\text{CZ}} &= 2264.1 \text{ s} \\
 \phi_{\text{CZ}} &= 1.9355 \\
 d_0 &= 0.00051477 \\
 d_2 &= 2.6612e-07 \mu \text{ Hz}^{-2} \\
 \tau_{\text{HI}} &= 293.77 \text{ s} \\
 \phi_{\text{HI}} &= 3.3274
 \end{aligned}$$

profile74

$$\chi^2_{\nu}(\text{dof} = 64) = 0.010273$$

# Age after ZAMS: 18.910 Gyr



$$a_0 = -4.4037 \mu \text{ Hz}$$

$$a_1 = 0.0027423$$

$$a_2 = -3.9378e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0022551$$

$$c_2 = 3.6995e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 797.58 \text{ s}$$

$$\phi_{\text{HeII}} = 6.2832$$

$$b_2 = 2.156e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 2314.5 \text{ s}$$

$$\phi_{\text{CZ}} = 1.0449$$

$$d_0 = 0.0012186$$

$$d_2 = 3.4583e-07 \mu\text{Hz}^{-2}$$

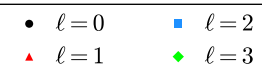
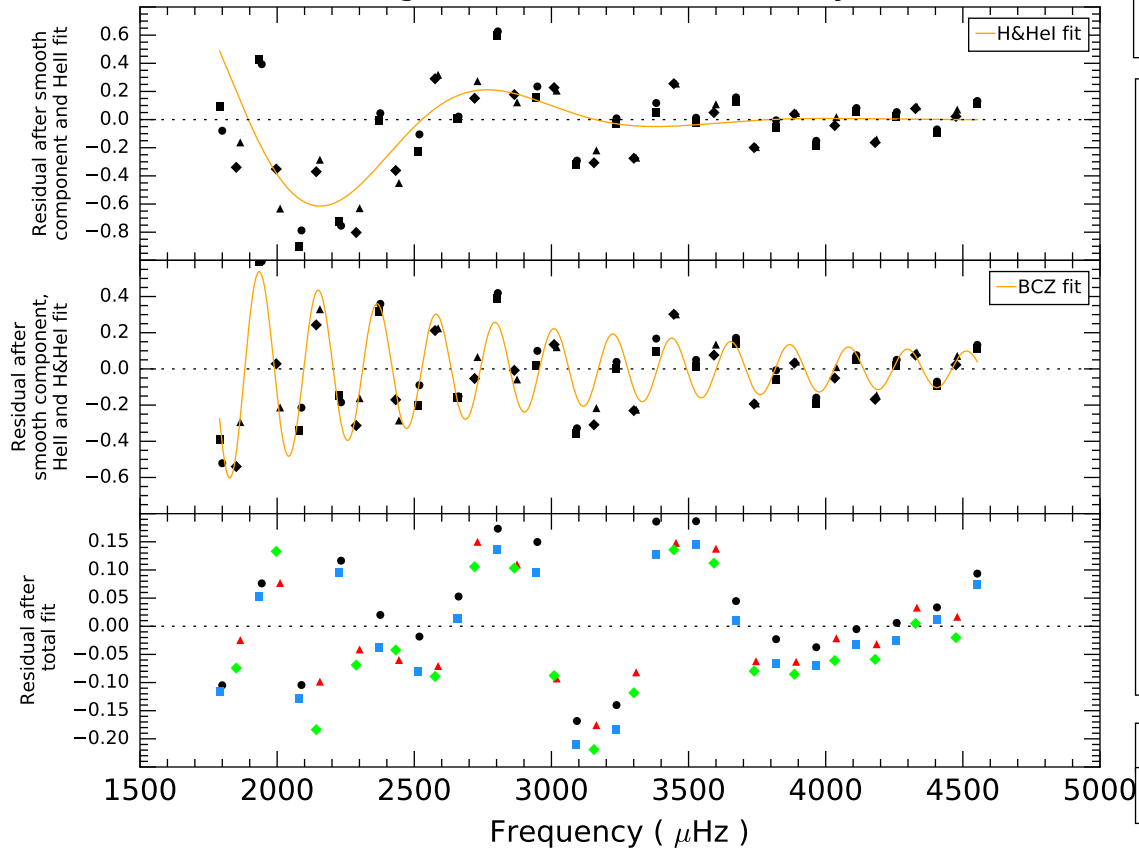
$$\tau_{\text{HI}} = 391.7 \text{ s}$$

$$\phi_{\text{HI}} = 7.168e-05$$

profile75

$$\chi^2_{\nu}(\text{dof} = 64) = 0.015905$$

# Age after ZAMS: 19.210 Gyr



$$\begin{aligned}
 a_0 &= -3.7927 \mu \text{ Hz} \\
 a_1 &= 0.0024201 \\
 a_2 &= -3.528e-07 \mu \text{ Hz}^{-1}
 \end{aligned}$$

$$\begin{aligned}
 c_0 &= 0.0020593 \\
 c_2 &= 3.7053e-07 \mu \text{ Hz}^{-2} \\
 \tau_{\text{HeII}} &= 804.11 \text{ s} \\
 \phi_{\text{HeII}} &= 6.281
 \end{aligned}$$

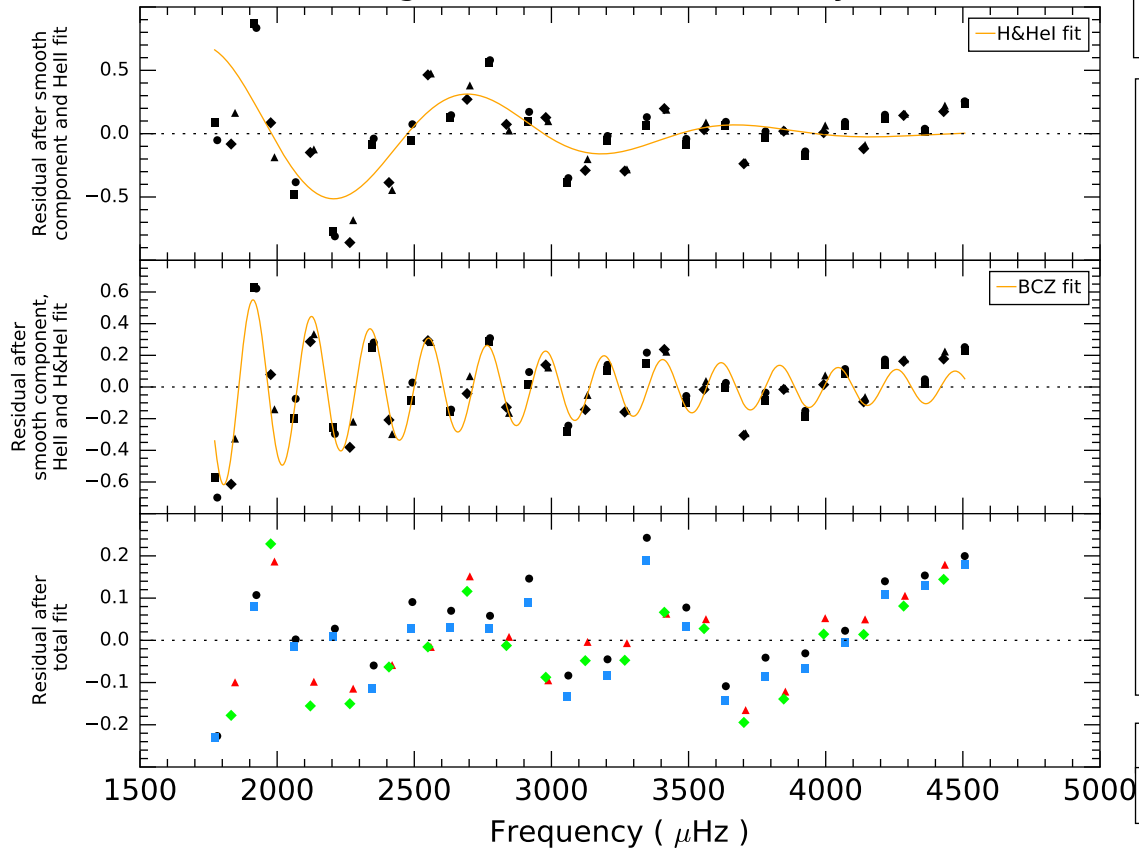
$$\begin{aligned}
 b_2 &= 2.014e+06 \text{ mHz}^3 \\
 \tau_{\text{CZ}} &= 2327.8 \text{ s} \\
 \phi_{\text{CZ}} &= 1.4916
 \end{aligned}$$

$$\begin{aligned}
 d_0 &= 0.0021393 \\
 d_2 &= 4.2533e-07 \mu \text{ Hz}^{-2} \\
 \tau_{\text{HI}} &= 395.38 \text{ s} \\
 \phi_{\text{HI}} &= 0.0097451
 \end{aligned}$$

profile76

$$\chi^2_{\nu}(\text{dof} = 64) = 0.012684$$

# Age after ZAMS: 19.510 Gyr



- $\bullet$   $\ell=0$
- $\blacktriangle$   $\ell=1$
- $\blacksquare$   $\ell=2$
- $\blacklozenge$   $\ell=3$

$$a_0 = -5.1823 \mu \text{ Hz}$$

$$a_1 = 0.003319$$

$$a_2 = -4.9351e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0012063$$

$$c_2 = 3.4818e-07 \mu\text{Hz}^{-2}$$

$$\tau_{HeII} = 814.06 \text{ s}$$

$$\phi_{HeII} = 6.2801$$

$$b_2 = 2.0133e+06 \text{ mHz}^3$$

$$\tau_{CZ} = 2344.5 \text{ s}$$

$$\phi_{CZ} = 1.7527$$

$$d_0 = 0.00095674$$

$$d_2 = 2.8836e-07 \mu\text{Hz}^{-2}$$

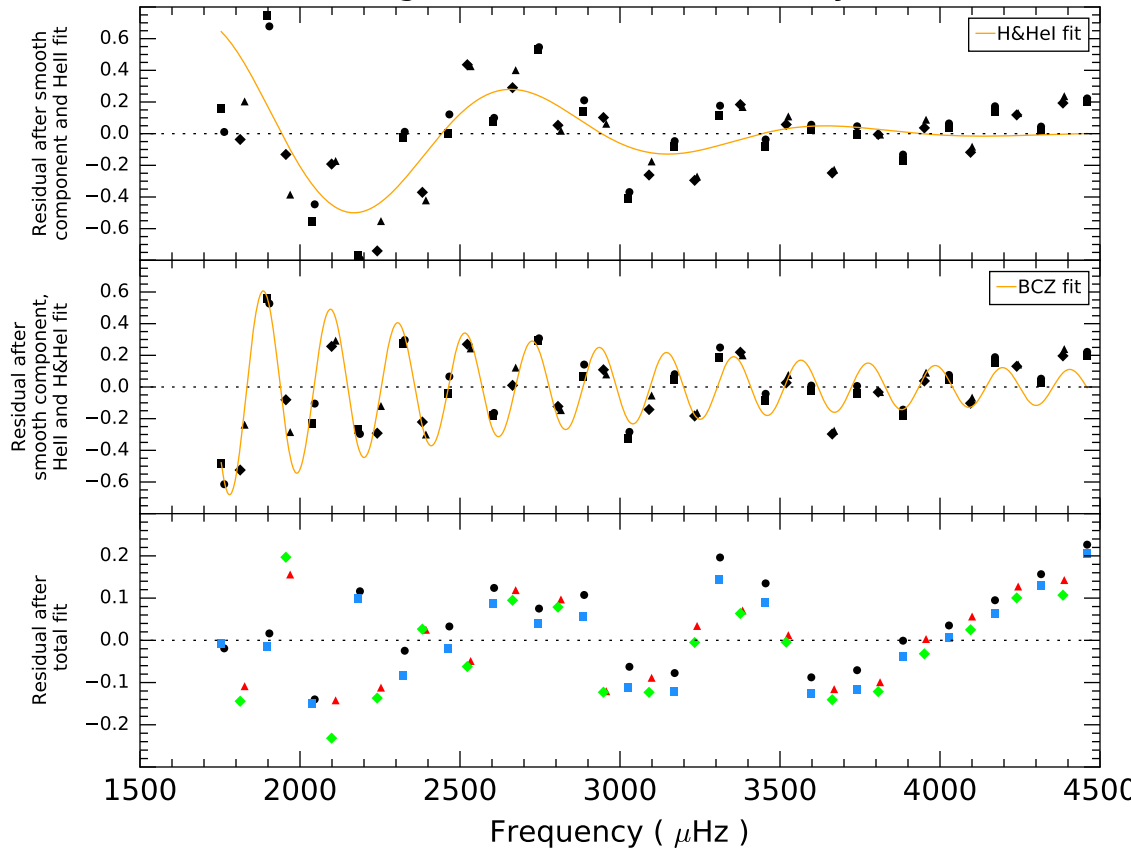
$$\tau_{HI} = 503.87 \text{ s}$$

$$\phi_{HI} = 3.1807$$

profile77

$$\chi^2_\nu(\text{dof} = 64) = 0.015093$$

# Age after ZAMS: 19.810 Gyr



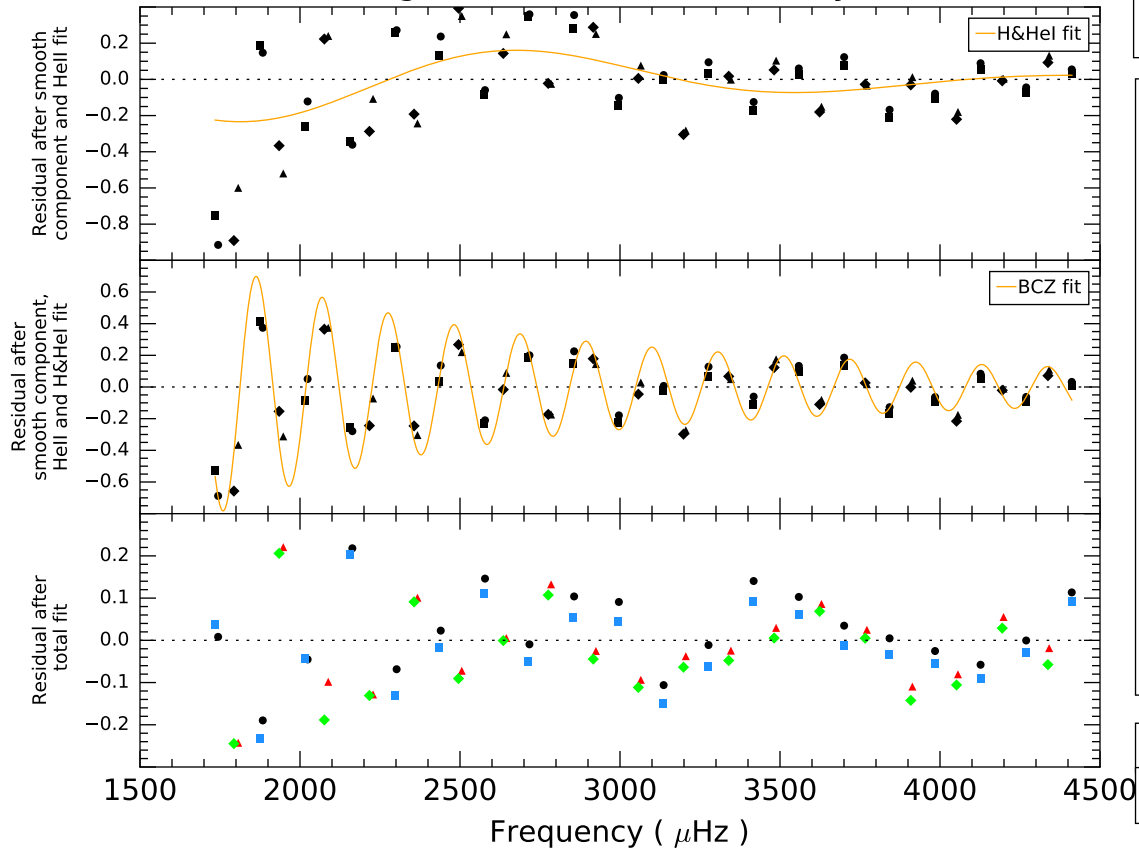
$$\begin{aligned}
 &\bullet \ell=0 \quad \blacksquare \ell=2 \\
 &\blacktriangle \ell=1 \quad \blacklozenge \ell=3
 \end{aligned}$$

$$\begin{aligned}
 a_0 &= -5.0834 \mu \text{ Hz} \\
 a_1 &= 0.0033057 \\
 a_2 &= -4.9853e-07 \mu \text{ Hz}^{-2} \\
 c_0 &= 0.0015466 \\
 c_2 &= 3.6986e-07 \mu \text{ Hz}^{-2} \\
 \tau_{\text{HeII}} &= 825.36 \text{ s} \\
 \phi_{\text{HeII}} &= 6.283 \\
 b_2 &= 2.1571e+06 \text{ mHz}^3 \\
 \tau_{\text{CZ}} &= 2381.3 \text{ s} \\
 \phi_{\text{CZ}} &= 1.6765 \\
 d_0 &= 0.0010811 \\
 d_2 &= 3.2615e-07 \mu \text{ Hz}^{-2} \\
 \tau_{\text{HI}} &= 500.1 \text{ s} \\
 \phi_{\text{HI}} &= 3.4998
 \end{aligned}$$

profile78

$$\chi^2_{\nu}(\text{dof} = 64) = 0.013531$$

Age after ZAMS: 20.110 Gyr



$$a_0 = -4.8825 \mu \text{ Hz}$$

$$a_1 = 0.0031195$$

$$a_2 = -4.6241e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0022555$$

$$c_2 = 3.6054e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 710.36 \text{ s}$$

$$\phi_{\text{HeII}} = 3.7246$$

$$b_2 = 2.4258e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 2426.2 \text{ s}$$

$$\phi_{\text{CZ}} = 1.2911$$

$$d_0 = 0.0002437$$

$$d_2 = 1.9294e-07 \mu\text{Hz}^{-2}$$

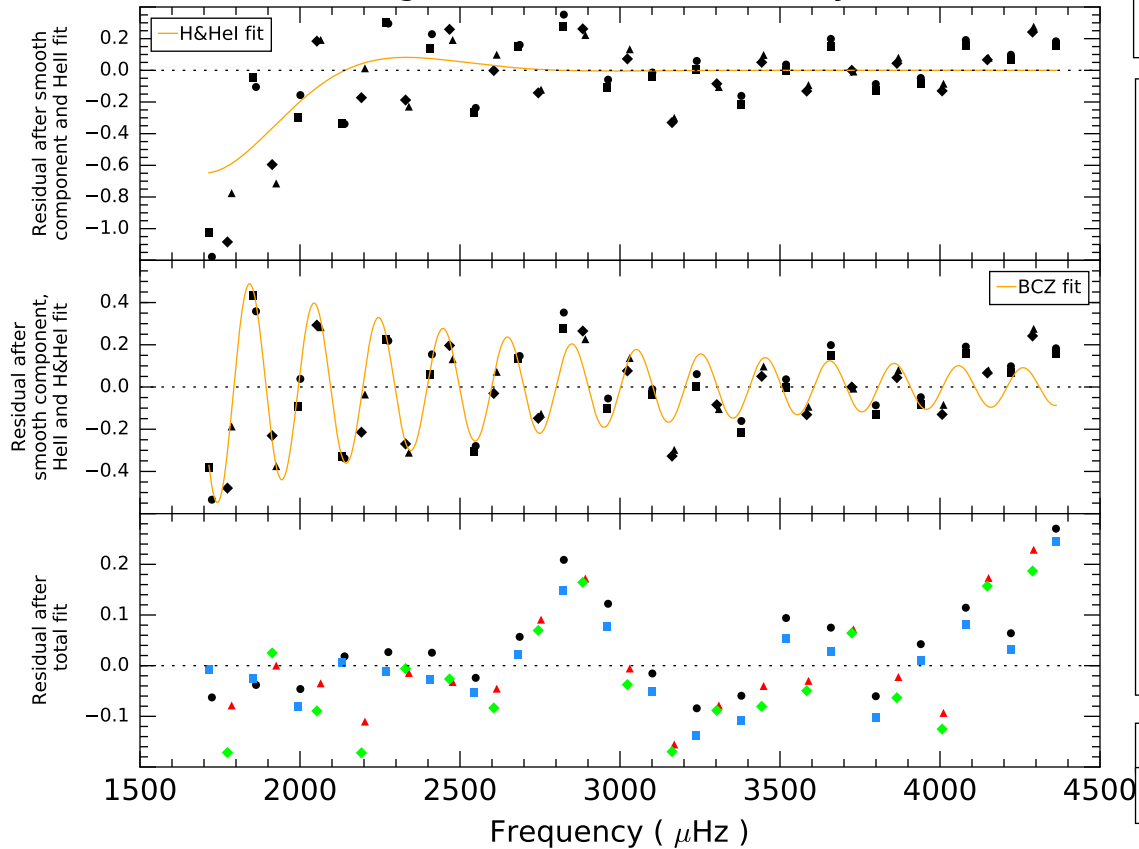
$$\tau_{\text{HI}} = 276.79 \text{ s}$$

$$\phi_{\text{HI}} = 4.6461$$

profile79

$$\chi^2_{\nu}(\text{dof} = 64) = 0.013128$$

# Age after ZAMS: 20.410 Gyr



- $\ell = 0$
- ▲  $\ell = 1$
- $\ell = 2$
- ◆  $\ell = 3$

$$a_0 = -4.9676 \mu \text{ Hz}$$

$$a_1 = 0.0033341$$

$$a_2 = -5.1812e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0024409$$

$$c_2 = 3.5162e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 702.44 \text{ s}$$

$$\phi_{\text{HeII}} = 4.1978$$

$$b_2 = 1.661e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 2483.1 \text{ s}$$

$$\phi_{\text{CZ}} = 0.5964$$

$$d_0 = 0.0056281$$

$$d_2 = 8.881e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HI}} = 372.51 \text{ s}$$

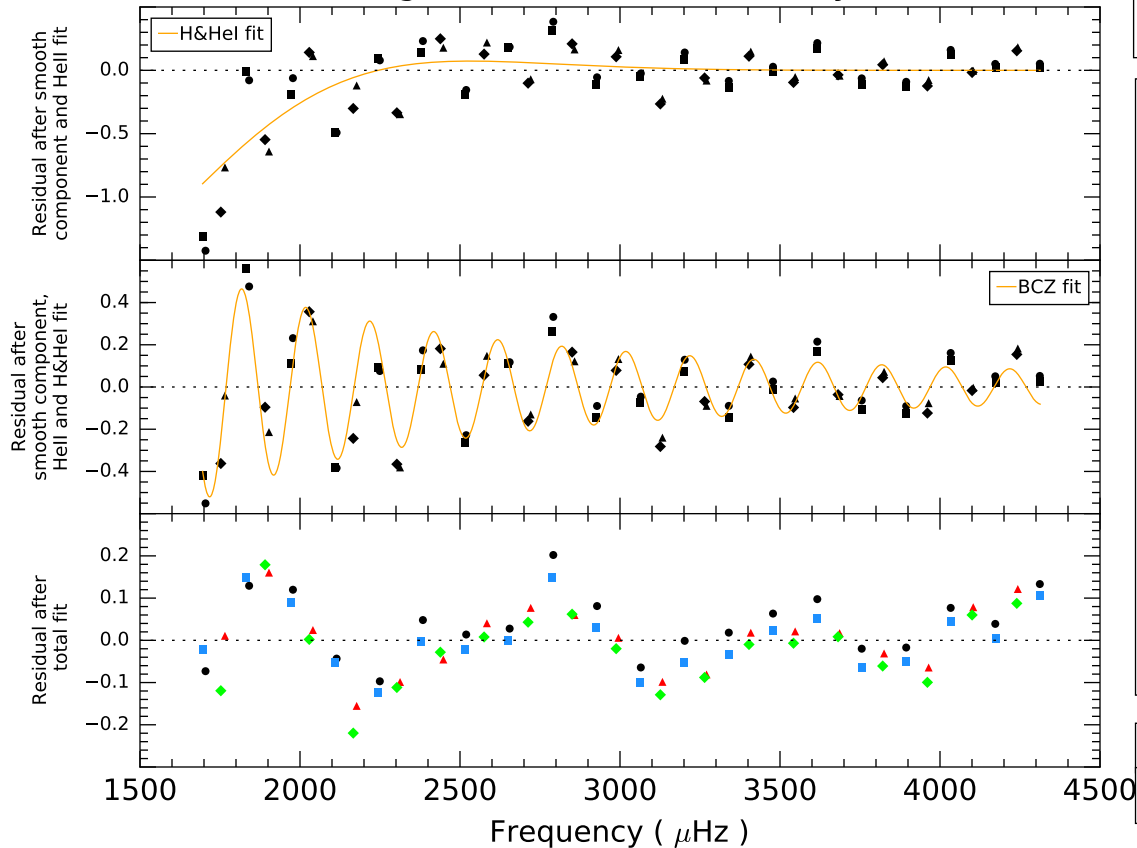
$$\phi_{\text{HI}} = 2.5484$$

profile80

$$\chi^2_{\nu}(\text{dof} = 64) = 0.012121$$



# Age after ZAMS: 20.710 Gyr



- $\bullet$   $\ell = 0$
- $\blacktriangle$   $\ell = 1$
- $\blacksquare$   $\ell = 2$
- $\blacklozenge$   $\ell = 3$

$$a_0 = -3.8862 \mu \text{ Hz}$$

$$a_1 = 0.0026725$$

$$a_2 = -4.2106e-07 \mu \text{ Hz}^{-2}$$

$$c_0 = 0.0021924$$

$$c_2 = 3.615e-07 \mu \text{ Hz}^{-2}$$

$$\tau_{\text{HeII}} = 707.06 \text{ s}$$

$$\phi_{\text{HeII}} = 4.4768$$

$$b_2 = 1.5364e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 2500.3 \text{ s}$$

$$\phi_{\text{CZ}} = 0.97568$$

$$d_0 = 0.0042278$$

$$d_2 = 6.824e-07 \mu \text{ Hz}^{-2}$$

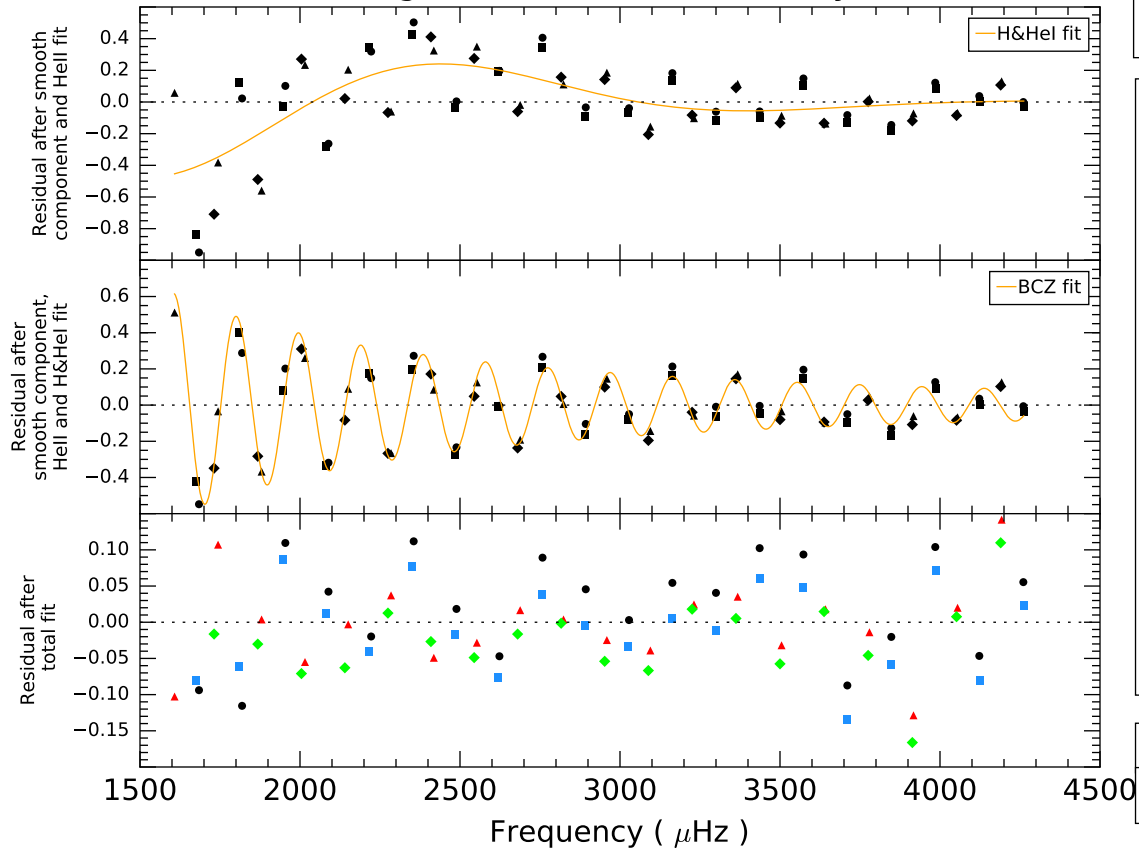
$$\tau_{\text{HI}} = 158.69 \text{ s}$$

$$\phi_{\text{HI}} = 1.8082$$

profile81

$$\chi^2_{\nu}(\text{dof} = 64) = 0.0083131$$

# Age after ZAMS: 21.010 Gyr



- $\bullet$   $\ell = 0$
- $\blacktriangle$   $\ell = 1$
- $\blacksquare$   $\ell = 2$
- $\blacklozenge$   $\ell = 3$

$$a_0 = -5.1896 \mu \text{ Hz}$$

$$a_1 = 0.003423$$

$$a_2 = -5.2724e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0029615$$

$$c_2 = 4.2805e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 727.56 \text{ s}$$

$$\phi_{\text{HeII}} = 4.0916$$

$$b_2 = 1.5901e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 2567.0 \text{ s}$$

$$\phi_{\text{CZ}} = 0.017752$$

$$d_0 = 0.00063868$$

$$d_2 = 3.0437e-07 \mu\text{Hz}^{-2}$$

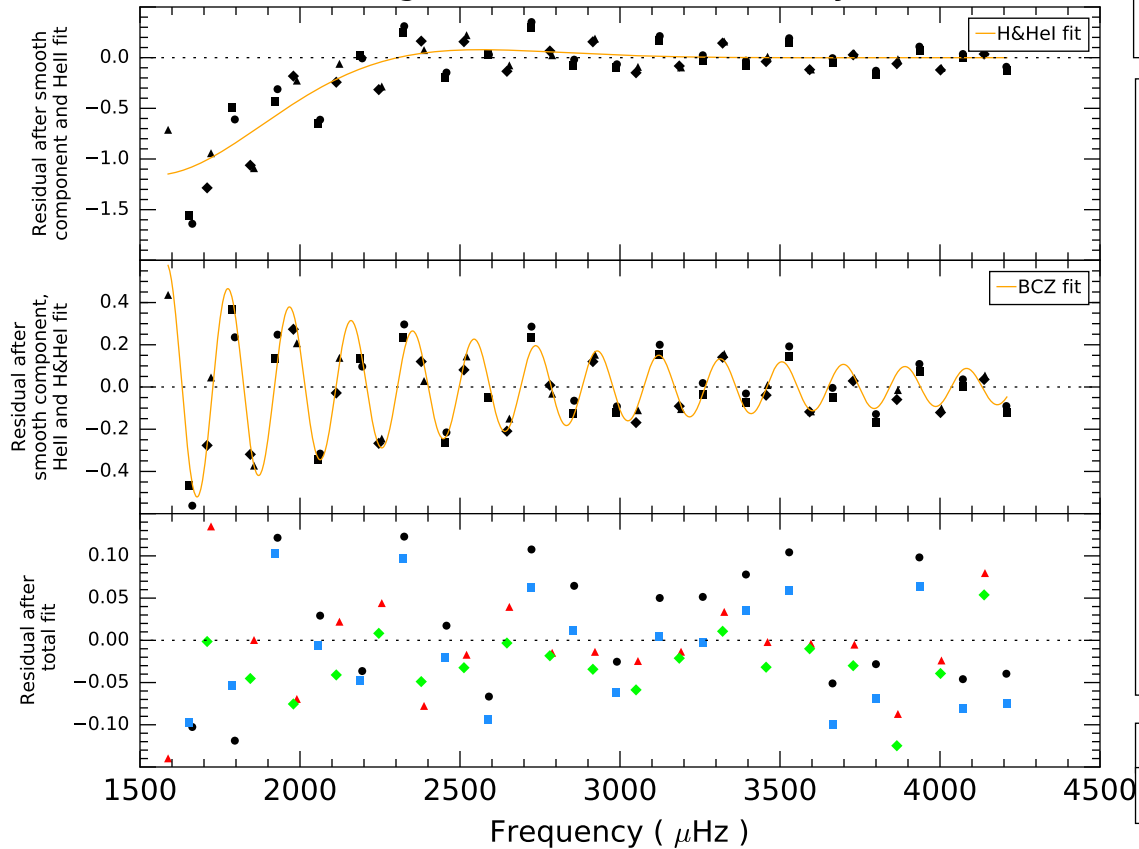
$$\tau_{\text{HI}} = 245.32 \text{ s}$$

$$\phi_{\text{HI}} = 6.2826$$

profile82

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0049575$$

Age after ZAMS: 21.310 Gyr



$$a_0 = -2.4854 \mu \text{ Hz}$$

$$a_1 = 0.0018707$$

$$a_2 = -3.1058e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0030699$$

$$c_2 = 4.4223e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 737.46 \text{ s}$$

$$\phi_{\text{HeII}} = 4.1443$$

$$b_2 = 1.4684e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 2599.9 \text{ s}$$

$$\phi_{\text{CZ}} = 0.10781$$

$$d_0 = 0.0044571$$

$$d_2 = 6.9144e-07 \mu\text{Hz}^{-2}$$

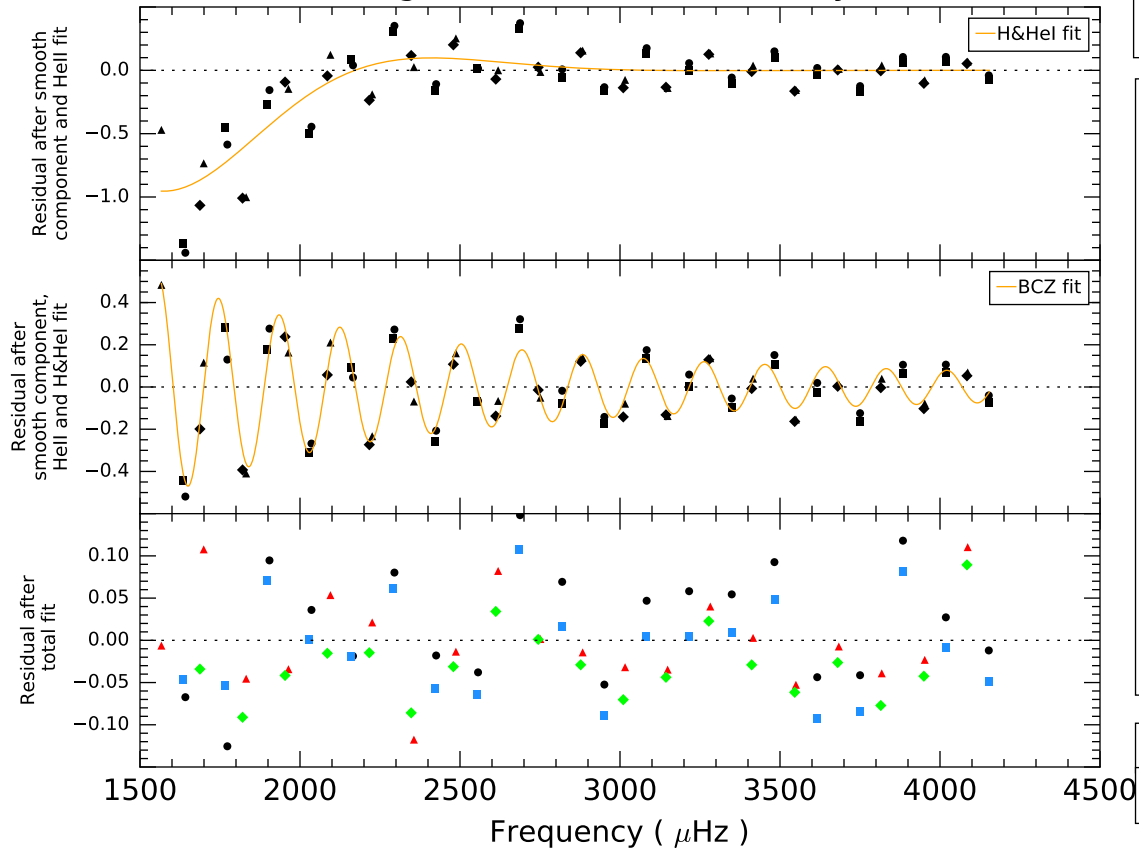
$$\tau_{\text{HI}} = 216.95 \text{ s}$$

$$\phi_{\text{HI}} = 6.283$$

profile83

$$\chi^2_{\nu}(\text{dof} = 65) = 0.004832$$

# Age after ZAMS: 21.610 Gyr



$$a_0 = -3.2639 \mu \text{ Hz}$$

$$a_1 = 0.0024048$$

$$a_2 = -4.0043e-07 \mu \text{ Hz}^{-2}$$

$$c_0 = 0.0032094$$

$$c_2 = 4.5179e-07 \mu \text{ Hz}^{-2}$$

$$\tau_{\text{HeII}} = 757.32 \text{ s}$$

$$\phi_{\text{HeII}} = 3.9596$$

$$b_2 = 1.2796e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 2636.3 \text{ s}$$

$$\phi_{\text{CZ}} = 0.27695$$

$$d_0 = 0.0043545$$

$$d_2 = 7.4945e-07 \mu \text{ Hz}^{-2}$$

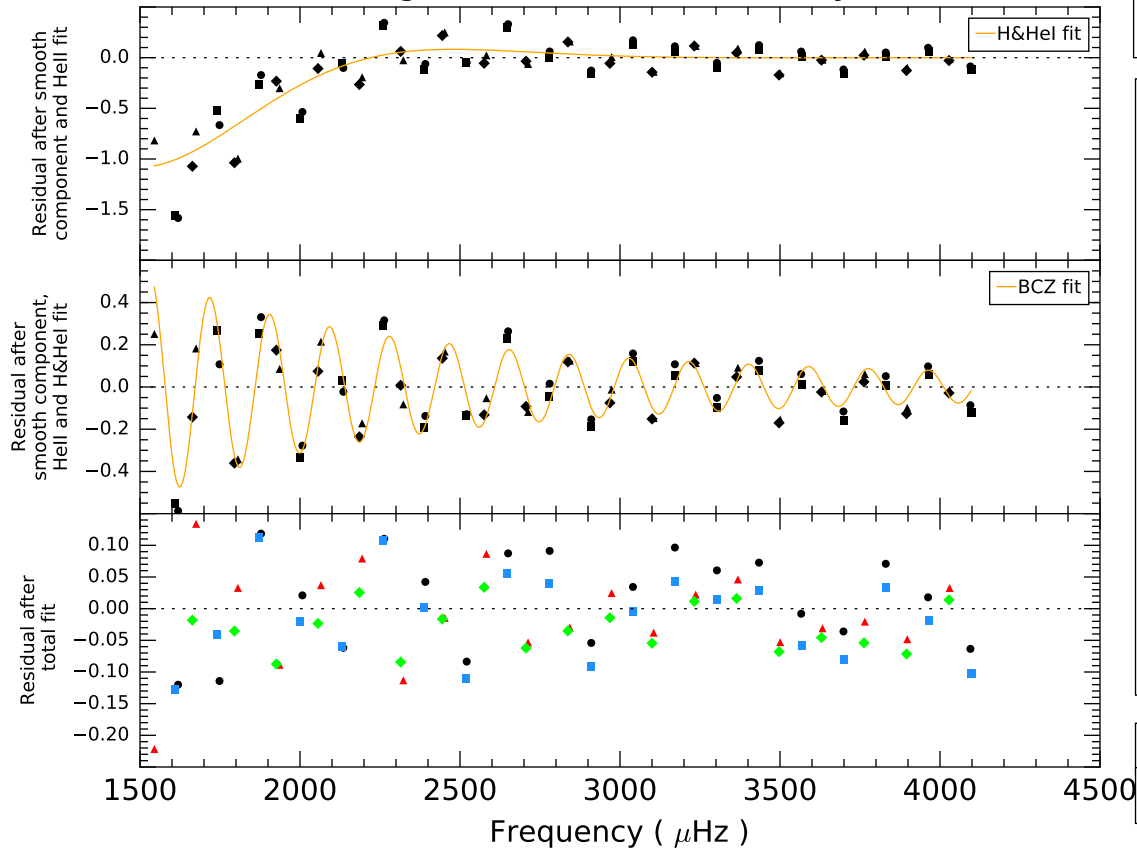
$$\tau_{\text{HI}} = 271.82 \text{ s}$$

$$\phi_{\text{HI}} = 5.1488$$

profile84

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0043568$$

# Age after ZAMS: 21.910 Gyr



- $\bullet$   $\ell = 0$
- $\blacktriangle$   $\ell = 1$
- $\blacksquare$   $\ell = 2$
- $\blacklozenge$   $\ell = 3$

$$a_0 = -2.4643 \mu \text{ Hz}$$

$$a_1 = 0.0019271$$

$$a_2 = -3.3229e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0030551$$

$$c_2 = 4.6671e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 762.47 \text{ s}$$

$$\phi_{\text{HeII}} = 4.2174$$

$$b_2 = 1.2504e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 2672.3 \text{ s}$$

$$\phi_{\text{CZ}} = 0.40008$$

$$d_0 = 0.0040303$$

$$d_2 = 7.139e-07 \mu\text{Hz}^{-2}$$

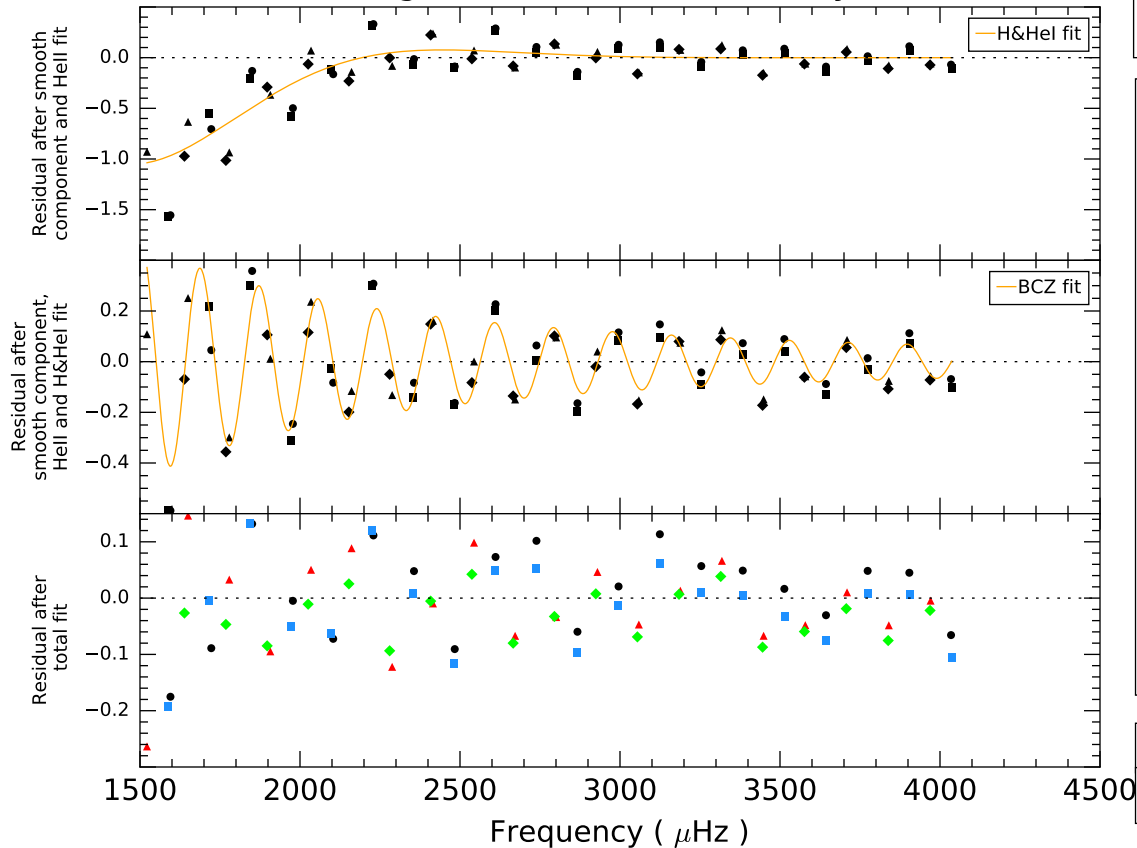
$$\tau_{\text{HI}} = 225.17 \text{ s}$$

$$\phi_{\text{HI}} = 6.2832$$

profile85

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0057566$$

# Age after ZAMS: 22.210 Gyr



$$a_0 = -2.3643 \mu \text{ Hz}$$

$$a_1 = 0.0019078$$

$$a_2 = -3.3758e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0030302$$

$$c_2 = 4.8075e-07 \mu\text{Hz}^{-2}$$

$$\tau_{HeII} = 774.1 \text{ s}$$

$$\phi_{HeII} = 4.3244$$

$$b_2 = 1.0508e+06 \text{ mHz}^3$$

$$\tau_{CZ} = 2715.3 \text{ s}$$

$$\phi_{CZ} = 0.51948$$

$$d_0 = 0.004077$$

$$d_2 = 7.4504e-07 \mu\text{Hz}^{-2}$$

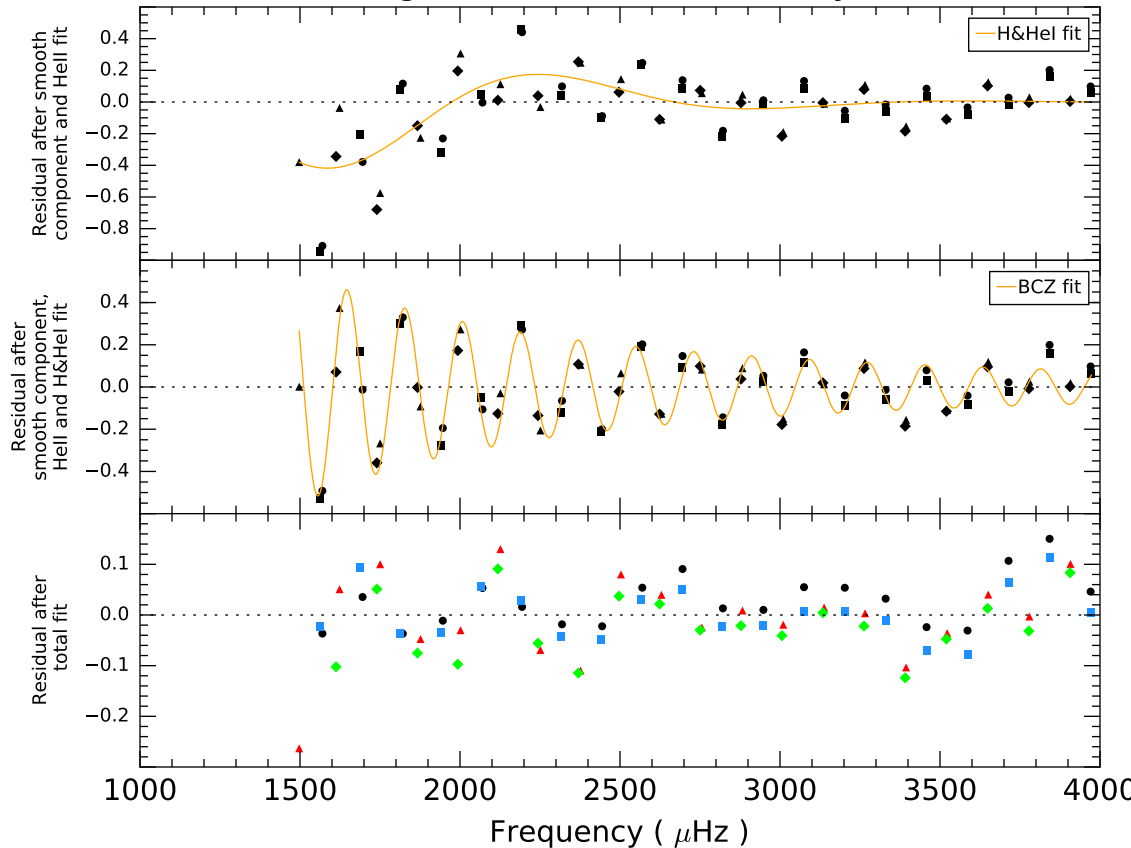
$$\tau_{HI} = 228.01 \text{ s}$$

$$\phi_{HI} = 6.2832$$

profile86

$$\chi^2_\nu(\text{dof} = 65) = 0.0072377$$

# Age after ZAMS: 22.510 Gyr



$$a_0 = -4.3925 \mu \text{ Hz}$$

$$a_1 = 0.0033149$$

$$a_2 = -5.7674e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0026665$$

$$c_2 = 4.722e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 790.6 \text{ s}$$

$$\phi_{\text{HeII}} = 4.2833$$

$$b_2 = 1.249e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 2767.9 \text{ s}$$

$$\phi_{\text{CZ}} = 0.82542$$

$$d_0 = 0.00086629$$

$$d_2 = 4.6625e-07 \mu\text{Hz}^{-2}$$

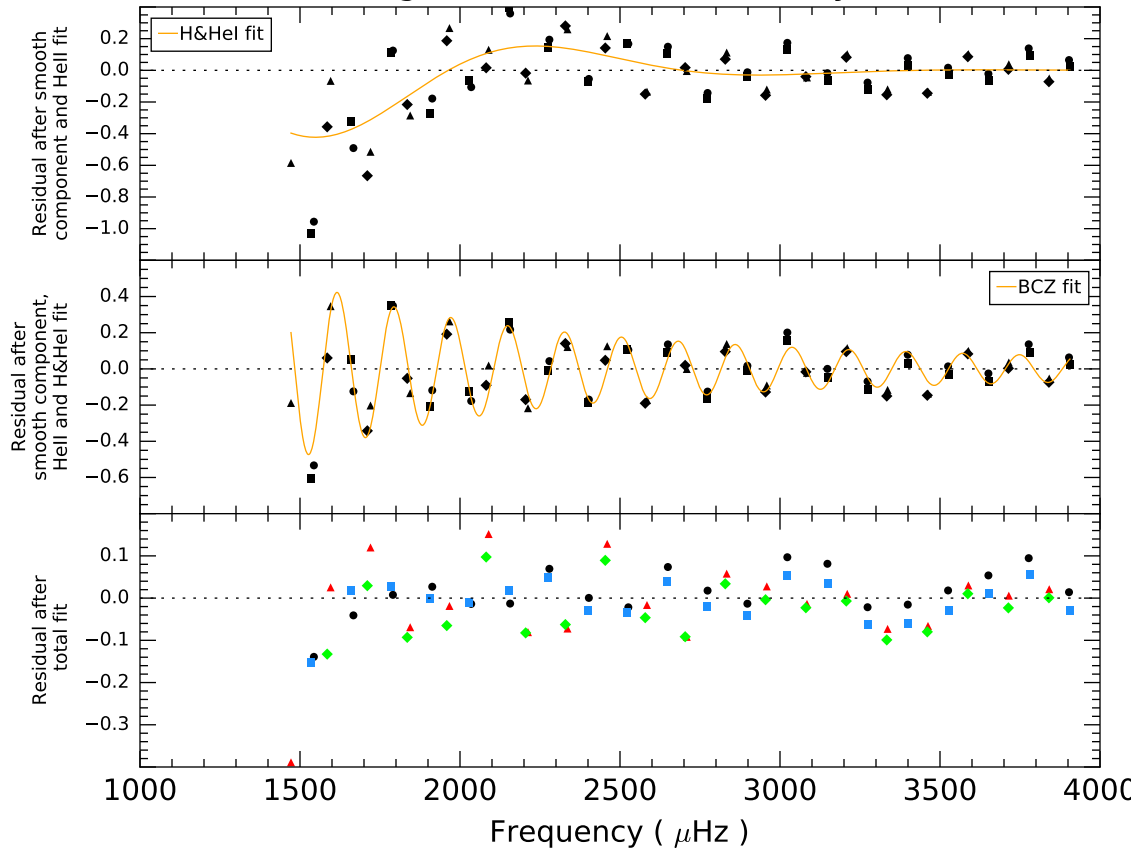
$$\tau_{\text{HI}} = 359.61 \text{ s}$$

$$\phi_{\text{HI}} = 3.6464$$

profile87

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0054193$$

Age after ZAMS: 22.810 Gyr



$$a_0 = -3.8958 \mu\text{Hz}$$

$$a_1 = 0.0030273$$

$$a_2 = -5.3919e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0029467$$

$$c_2 = 5.1328e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 815.66 \text{ s}$$

$$\phi_{\text{HeII}} = 4.1919$$

$$b_2 = 1.1044e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 2814.0 \text{ s}$$

$$\phi_{\text{CZ}} = 0.95466$$

$$d_0 = 0.0009421$$

$$d_2 = 5.0705e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HI}} = 341.9 \text{ s}$$

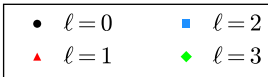
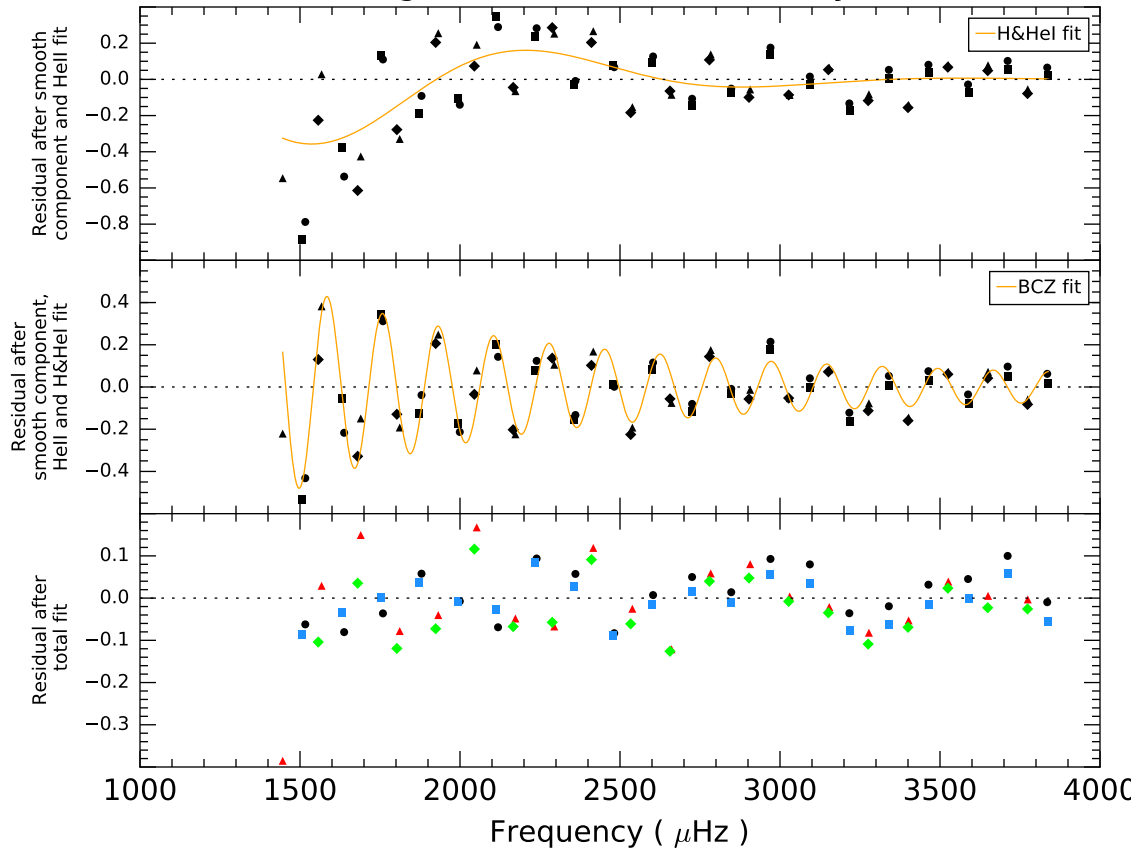
$$\phi_{\text{HI}} = 4.1317$$

profile88

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0068811$$



Age after ZAMS: 23.098 Gyr



$$a_0 = -3.9488 \mu \text{ Hz}$$

$$a_1 = 0.0031372$$

$$a_2 = -5.7165e-07 \mu\text{Hz}^{-1}$$

$$c_0 = 0.0029249$$

$$c_2 = 5.3169e-07 \mu\text{Hz}^{-2}$$

$$\tau_{HeII} = 849.22 \text{ s}$$

$$\phi_{HeII} = 3.8875$$

$$b_2 = 1.0765e+06 \text{ mHz}^3$$

$$\tau_{CZ} = 2882.0 \text{ s}$$

$$\phi_{CZ} = 0.71666$$

$$d_0 = 0.00067653$$

$$d_2 = 4.467e-07 \mu\text{Hz}^{-2}$$

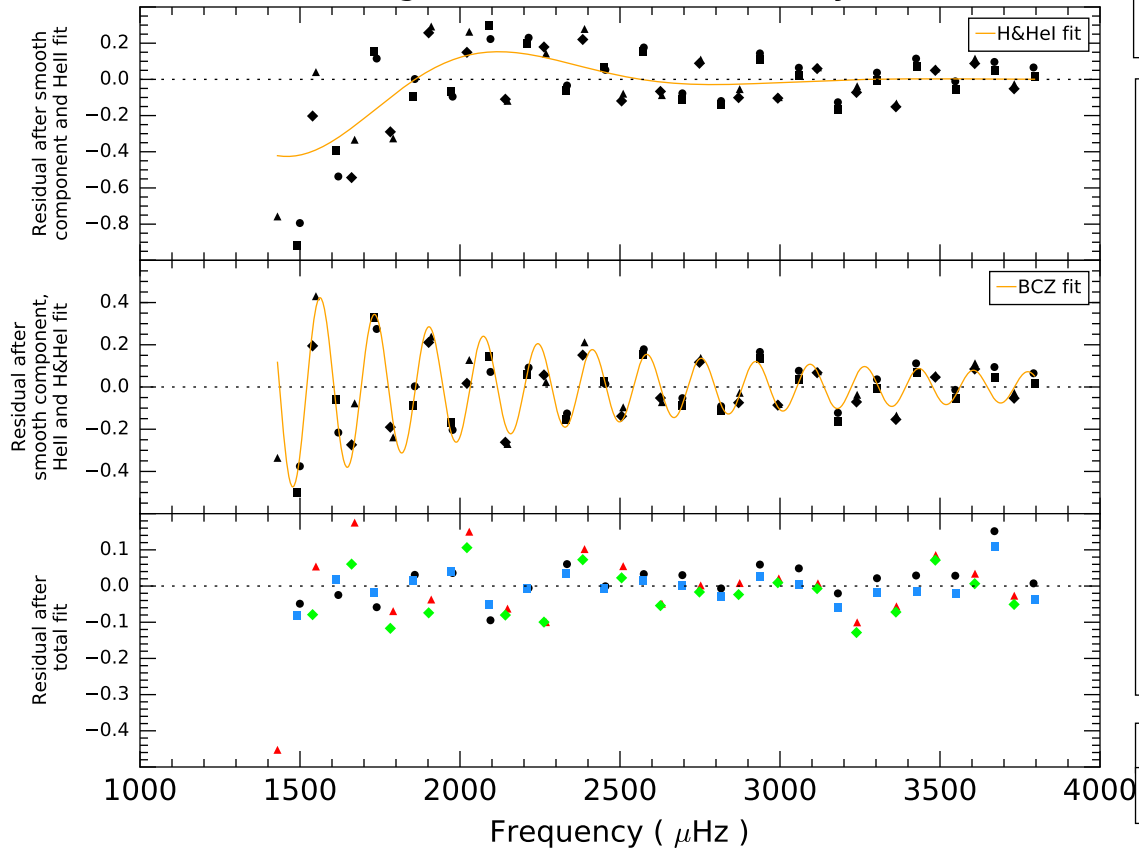
$$\tau_{HI} = 353.94 \text{ s}$$

$$\phi_{HI} = 4.0015$$

profile89

$$\chi^2_\nu(\text{dof} = 65) = 0.0075148$$

Age after ZAMS: 23.271 Gyr



$$a_0 = -3.95 \mu \text{ Hz}$$

$$a_1 = 0.0031997$$

$$a_2 = -5.9438e-07 \mu\text{Hz}^{-1}$$

$$c_0 = 0.003039$$

$$c_2 = 5.4278e-07 \mu\text{Hz}^{-2}$$

$$\tau_{HeII} = 833.85 \text{ s}$$

$$\phi_{HeII} = 4.5198$$

$$b_2 = 1.0337e+06 \text{ mHz}^3$$

$$\tau_{CZ} = 2939.2 \text{ s}$$

$$\phi_{CZ} = 0.37104$$

$$d_0 = 0.00099324$$

$$d_2 = 5.6427e-07 \mu\text{Hz}^{-2}$$

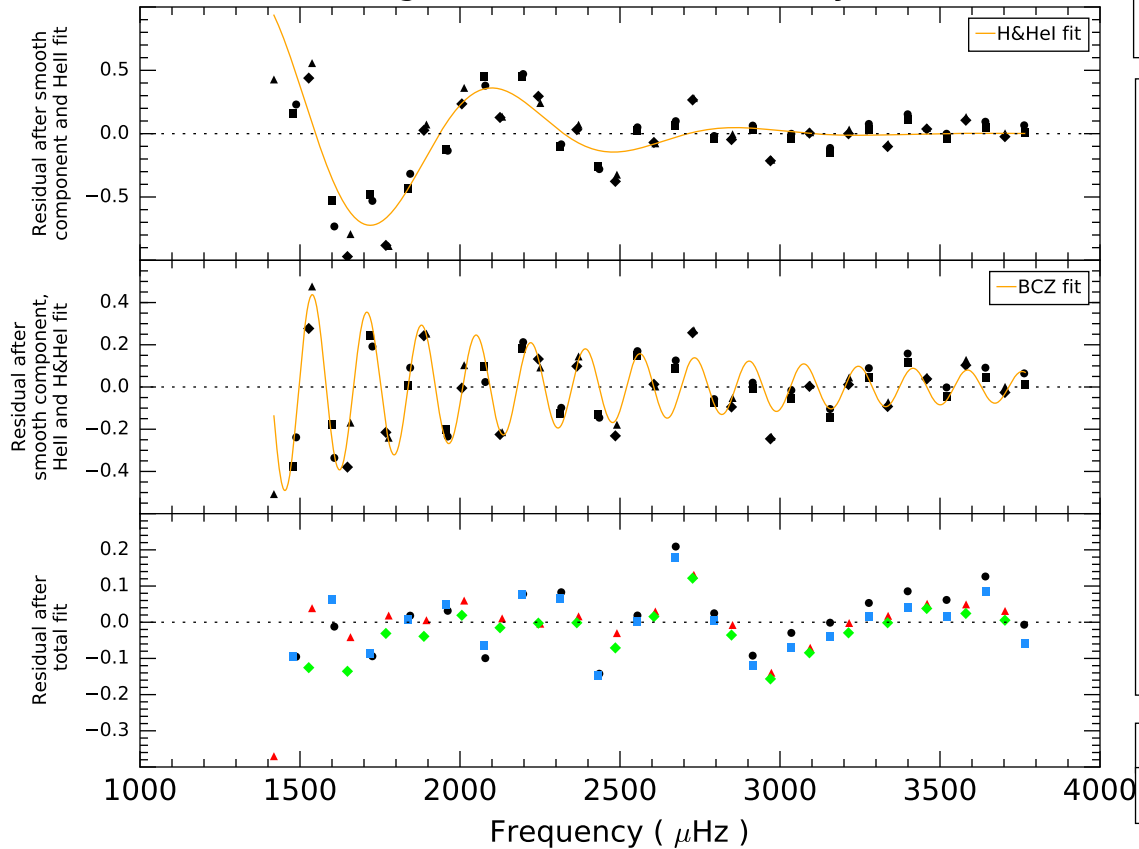
$$\tau_{HI} = 354.53 \text{ s}$$

$$\phi_{HI} = 4.2814$$

profile90

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0077348$$

# Age after ZAMS: 23.385 Gyr



$$a_0 = -3.6736 \mu \text{ Hz}$$

$$a_1 = 0.0030864$$

$$a_2 = -5.8896e-07 \mu \text{ Hz}^{-2}$$

$$c_0 = 0.0015713$$

$$c_2 = 5.2372e-07 \mu \text{ Hz}^{-2}$$

$$\tau_{\text{HeII}} = 1036.0 \text{ s}$$

$$\phi_{\text{HeII}} = 6.1307$$

$$b_2 = 1.0358e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 2930.5 \text{ s}$$

$$\phi_{\text{CZ}} = 1.4397$$

$$d_0 = 0.0025759$$

$$d_2 = 6.0701e-07 \mu \text{ Hz}^{-2}$$

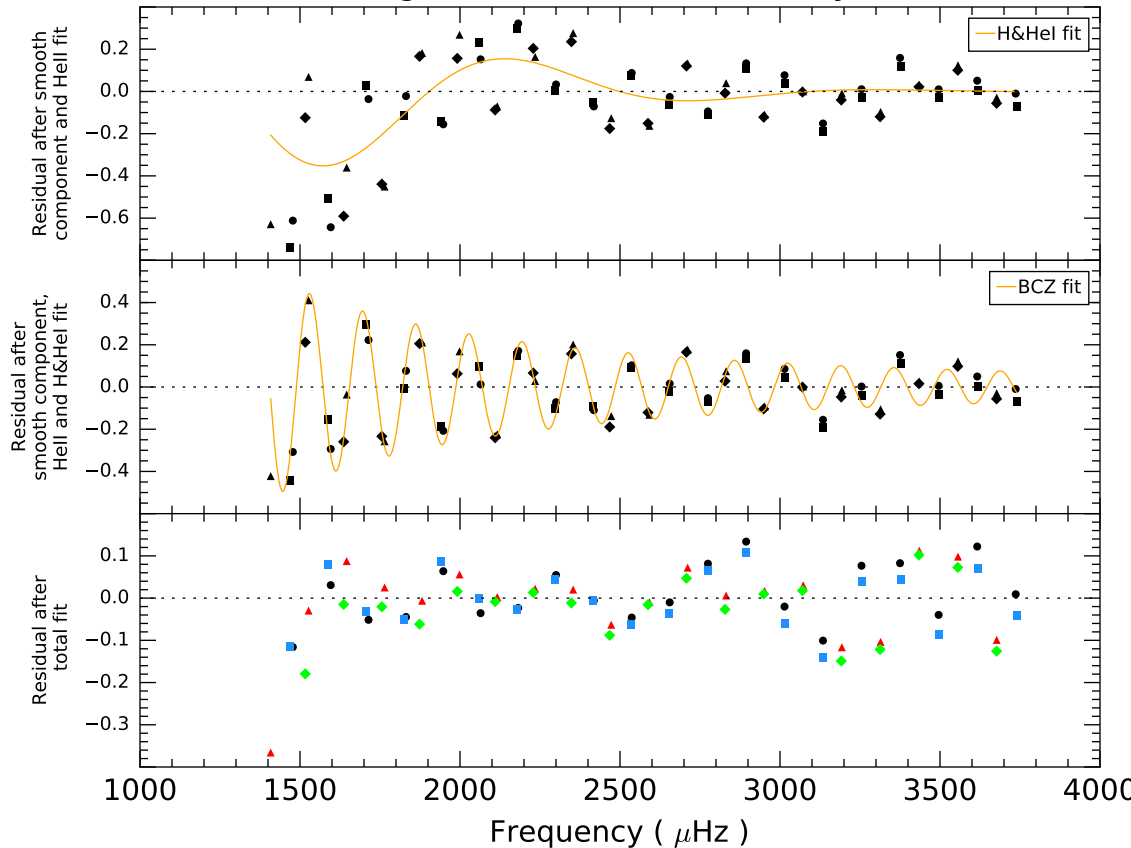
$$\tau_{\text{HI}} = 644.53 \text{ s}$$

$$\phi_{\text{HI}} = 3.1676$$

profile91

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0085969$$

Age after ZAMS: 23.487 Gyr



$$a_0 = -3.6764 \mu \text{ Hz}$$

$$a_1 = 0.003081$$

$$a_2 = -5.8833e-07 \mu\text{Hz}^{-1}$$

$$c_0 = 0.0027334$$

$$c_2 = 5.4674e-07 \mu\text{Hz}^{-2}$$

$$\tau_{HeII} = 885.21 \text{ s}$$

$$\phi_{HeII} = 3.7612$$

$$b_2 = 1.0349e+06 \text{ mHz}^3$$

$$\tau_{CZ} = 3011.7 \text{ s}$$

$$\phi_{CZ} = 0.21113$$

$$d_0 = 0.00082337$$

$$d_2 = 5.192e-07 \mu\text{Hz}^{-2}$$

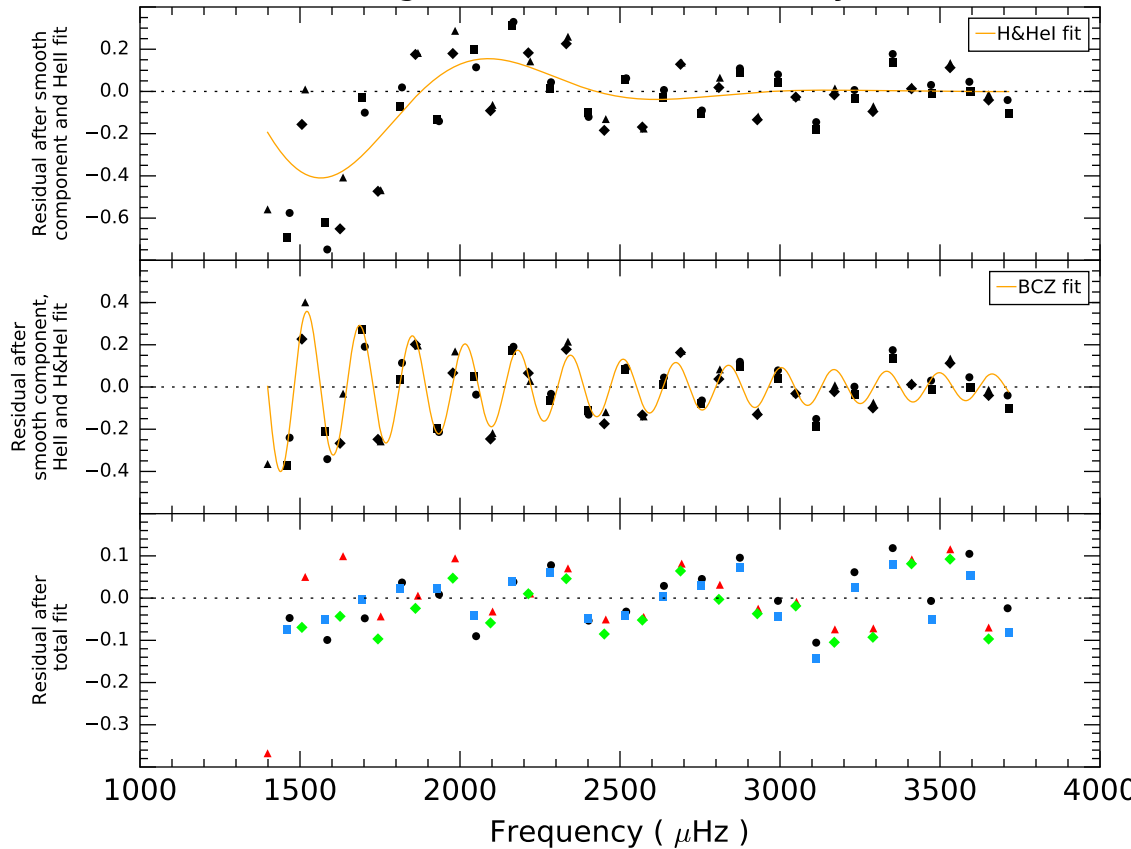
$$\tau_{HI} = 420.89 \text{ s}$$

$$\phi_{HI} = 2.4988$$

profile92

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0080156$$

Age after ZAMS: 23.583 Gyr



$$a_0 = -3.6387 \mu \text{ Hz}$$

$$a_1 = 0.0030966$$

$$a_2 = -5.9948e-07 \mu\text{Hz}^{-1}$$

$$c_0 = 0.0028697$$

$$c_2 = 5.6692e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 906.5 \text{ s}$$

$$\phi_{\text{HeII}} = 3.4243$$

$$b_2 = 8.3032e+05 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 3036.5 \text{ s}$$

$$\phi_{\text{CZ}} = 0.026083$$

$$d_0 = 0.0012813$$

$$d_2 = 6.3728e-07 \mu\text{Hz}^{-2}$$

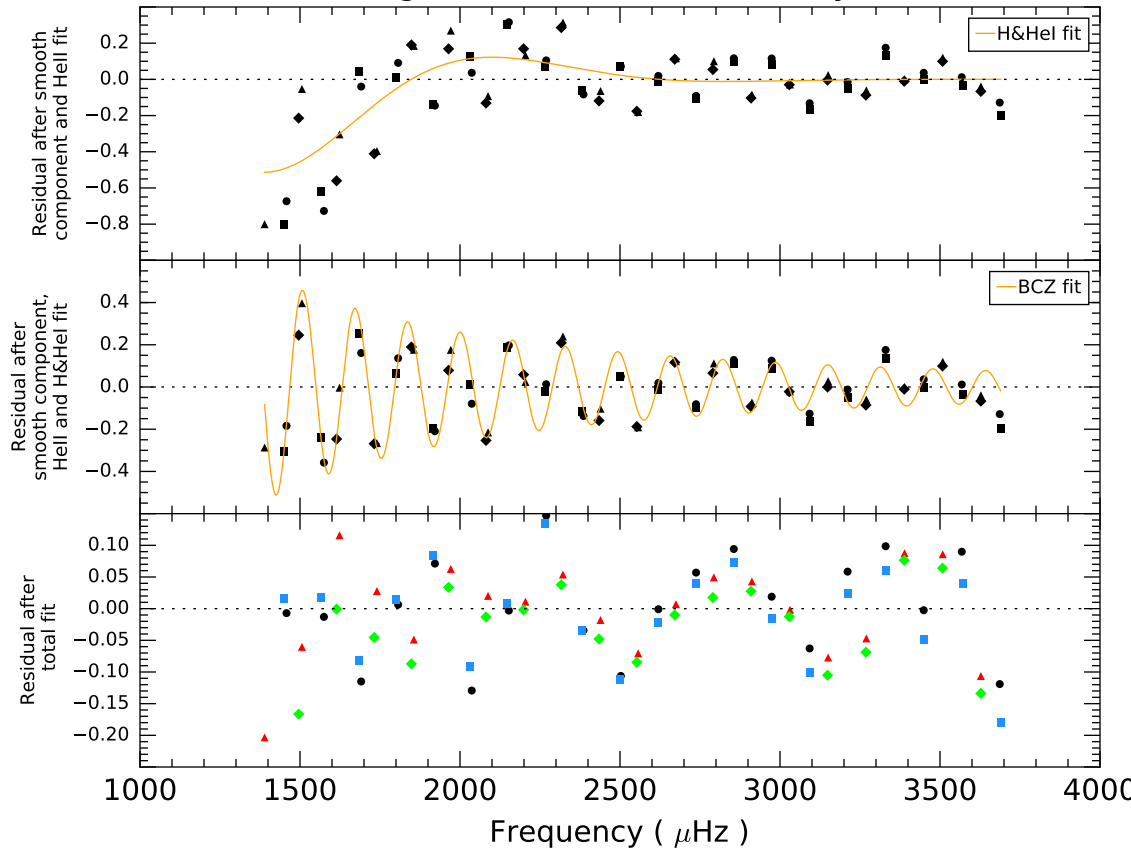
$$\tau_{\text{HI}} = 457.3 \text{ s}$$

$$\phi_{\text{HI}} = 1.7723$$

profile93

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0070012$$

Age after ZAMS: 23.674 Gyr



$$a_0 = -3.3774 \mu \text{ Hz}$$

$$a_1 = 0.0029048$$

$$a_2 = -5.6745e-07 \mu\text{Hz}^{-1}$$

$$c_0 = 0.0029848$$

$$c_2 = 5.6007e-07 \mu\text{Hz}^{-2}$$

$$\tau_{HeII} = 896.41 \text{ s}$$

$$\phi_{HeII} = 3.8652$$

$$b_2 = 1.0413e+06 \text{ mHz}^3$$

$$\tau_{CZ} = 3046.0 \text{ s}$$

$$\phi_{CZ} = 0.37882$$

$$d_0 = 0.0014781$$

$$d_2 = 6.9709e-07 \mu\text{Hz}^{-2}$$

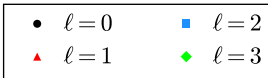
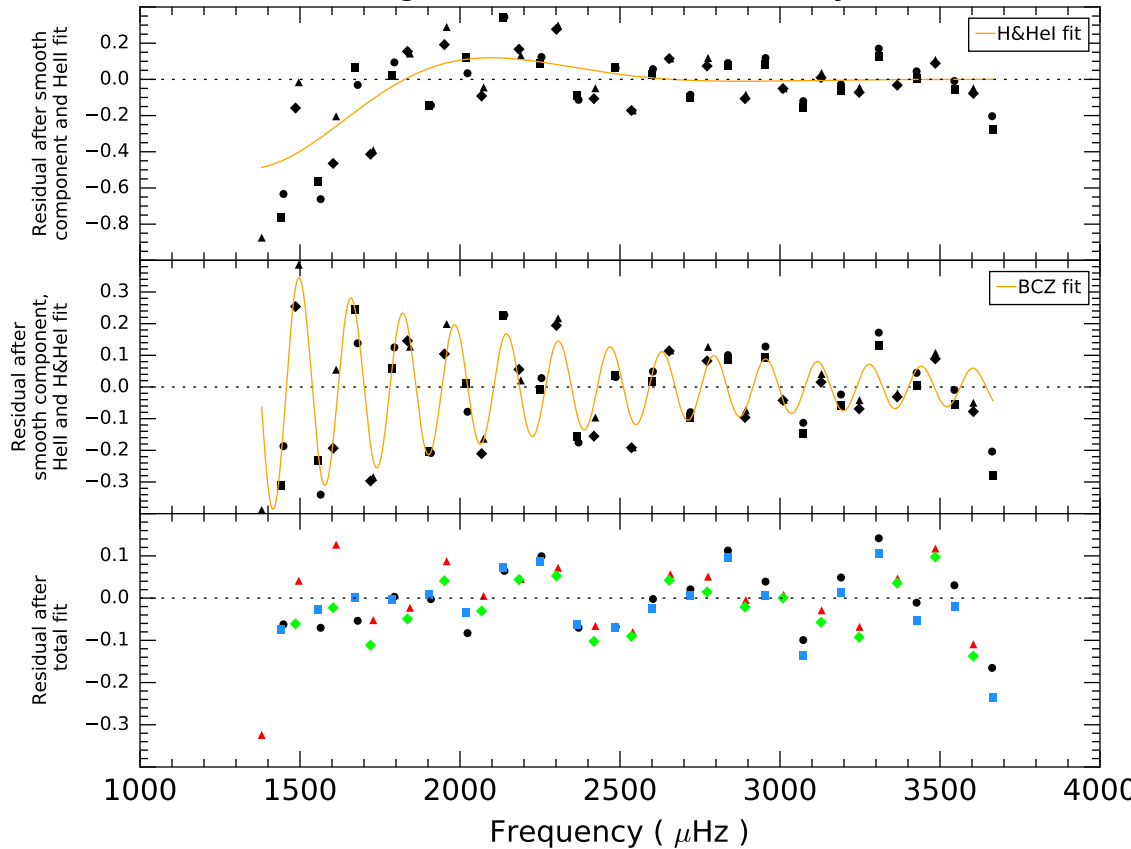
$$\tau_{HI} = 322.17 \text{ s}$$

$$\phi_{HI} = 5.0881$$

profile94

$$\chi^2_\nu(\text{dof} = 65) = 0.0067905$$

Age after ZAMS: 23.761 Gyr



$$\begin{aligned}
 a_0 &= -3.3568 \mu\text{Hz} \\
 a_1 &= 0.0029023 \\
 a_2 &= -5.7052e-07 \mu\text{Hz}^{-2}
 \end{aligned}$$

$$\begin{aligned}
 c_0 &= 0.0031103 \\
 c_2 &= 5.8283e-07 \mu\text{Hz}^{-2} \\
 \tau_{HeII} &= 902.37 \text{ s} \\
 \phi_{HeII} &= 3.955
 \end{aligned}$$

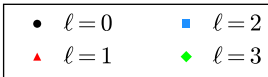
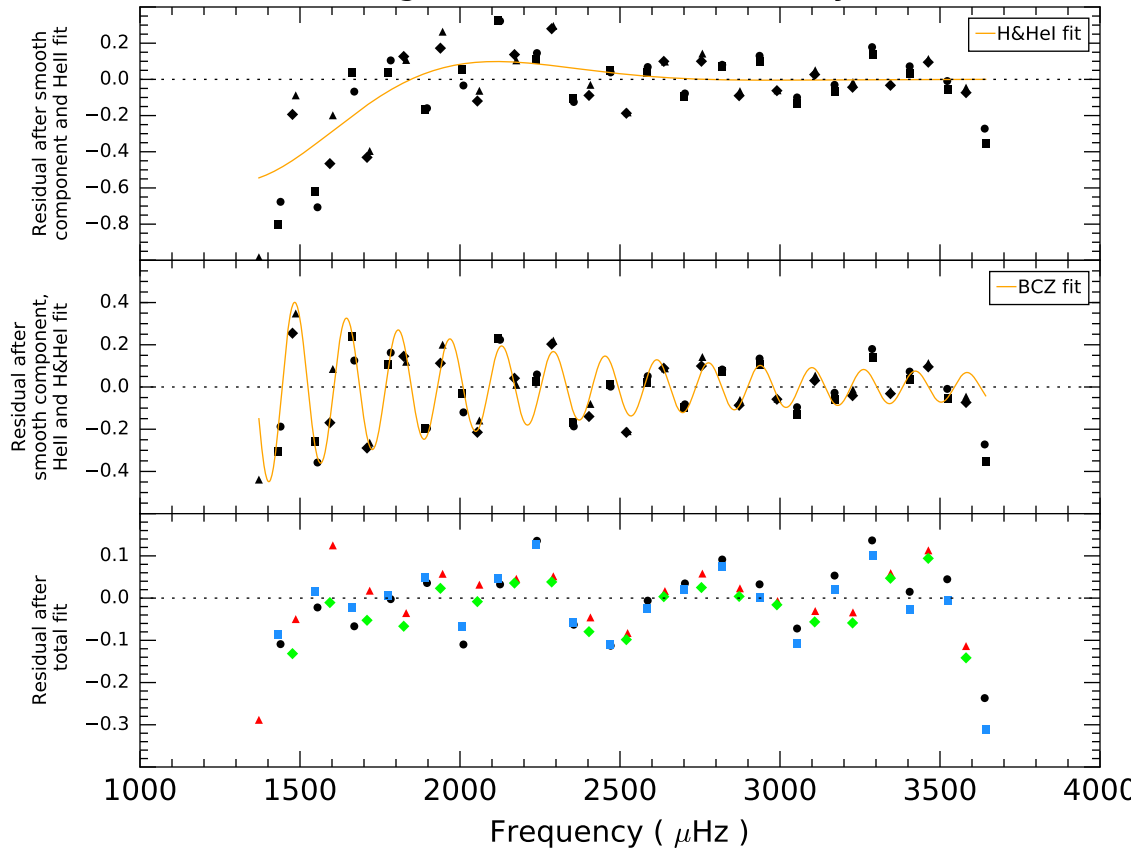
$$\begin{aligned}
 b_2 &= 7.739e+05 \text{ mHz}^3 \\
 \tau_{CZ} &= 3086.9 \text{ s} \\
 \phi_{CZ} &= 0.020546
 \end{aligned}$$

$$\begin{aligned}
 d_0 &= 0.0012665 \\
 d_2 &= 6.6844e-07 \mu\text{Hz}^{-2} \\
 \tau_{HI} &= 299.63 \text{ s} \\
 \phi_{HI} &= 5.6888
 \end{aligned}$$

profile95

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0080622$$

Age after ZAMS: 23.844 Gyr



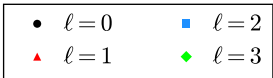
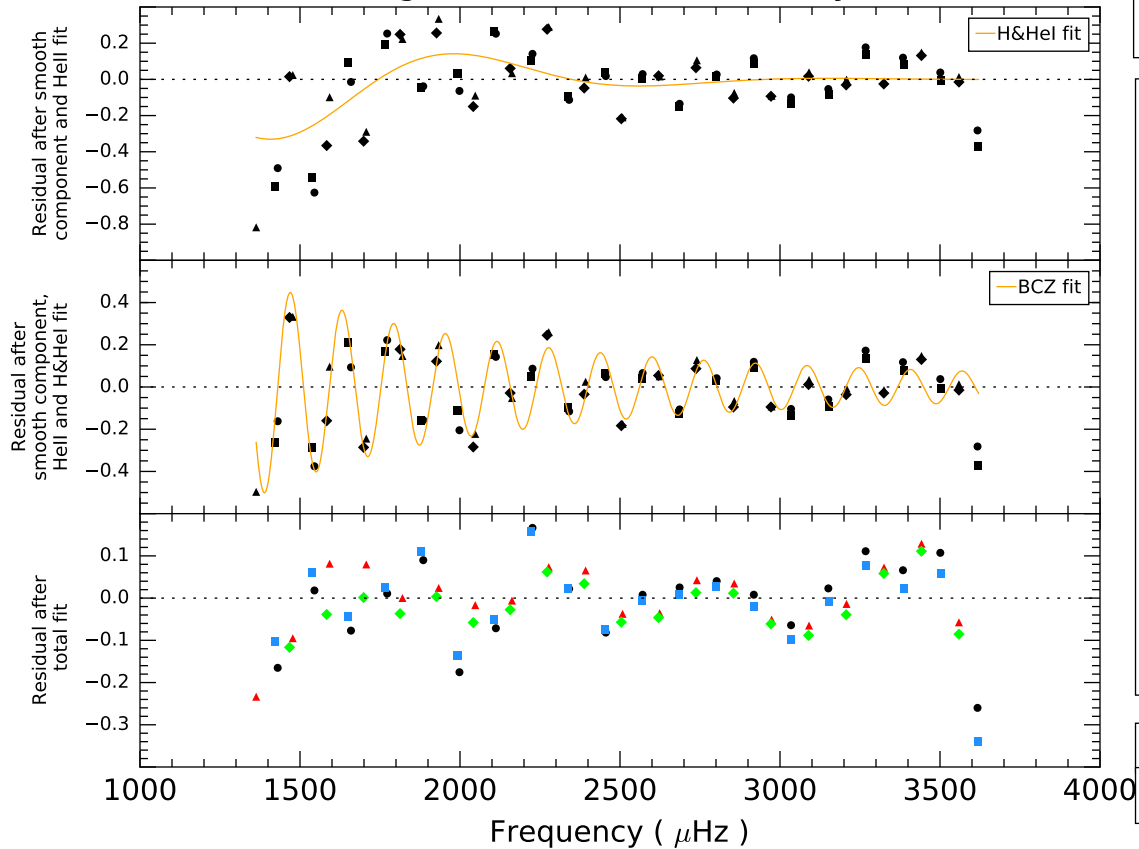
$$\begin{aligned}
 a_0 &= -3.1478 \mu \text{ Hz} \\
 a_1 &= 0.0027917 \\
 a_2 &= -5.5957e-07 \mu \text{ Hz}^{-2} \\
 c_0 &= 0.0031715 \\
 c_2 &= 5.8586e-07 \mu \text{ Hz}^{-2} \\
 \tau_{HeII} &= 907.38 \text{ s} \\
 \phi_{HeII} &= 4.0144 \\
 b_2 &= 8.8326e+05 \text{ mHz}^3 \\
 \tau_{CZ} &= 3094.4 \text{ s} \\
 \phi_{CZ} &= 0.39872 \\
 d_0 &= 0.0015913 \\
 d_2 &= 7.3745e-07 \mu \text{ Hz}^{-2} \\
 \tau_{HI} &= 271.65 \text{ s} \\
 \phi_{HI} &= 6.2637
 \end{aligned}$$

profile96

$$\chi^2_\nu(\text{dof} = 65) = 0.0088655$$



Age after ZAMS: 23.923 Gyr



$$a_0 = -4.0162 \mu \text{ Hz}$$

$$a_1 = 0.003494$$

$$a_2 = -6.9643e-07 \mu\text{Hz}^{-1}$$

$$c_0 = 0.0032107$$

$$c_2 = 5.9119e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 900.21 \text{ s}$$

$$\phi_{\text{HeII}} = 4.2612$$

$$b_2 = 9.6754e+05 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 3097.2 \text{ s}$$

$$\phi_{\text{CZ}} = 0.88581$$

$$d_0 = 0.00076984$$

$$d_2 = 5.905e-07 \mu\text{Hz}^{-2}$$

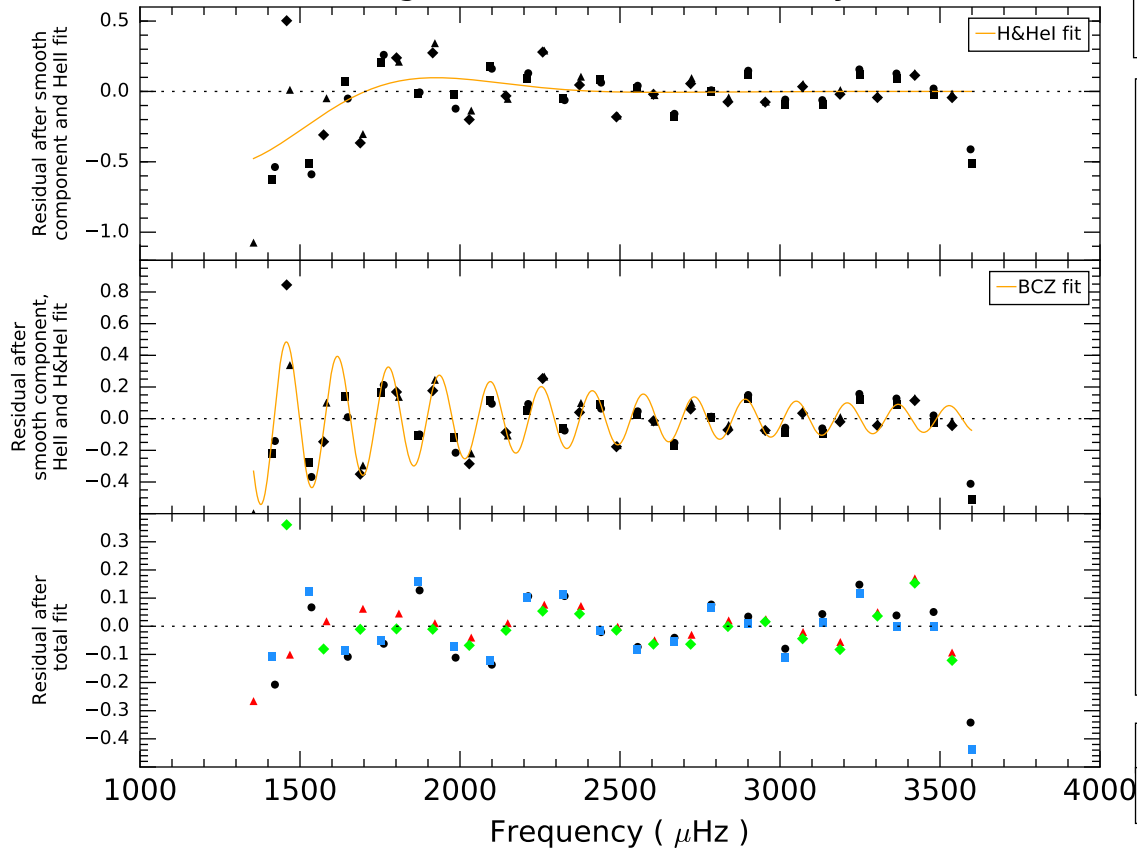
$$\tau_{\text{HI}} = 414.15 \text{ s}$$

$$\phi_{\text{HI}} = 3.4887$$

profile97

$$\chi^2_{\nu}(\text{dof} = 65) = 0.0096178$$

# Age after ZAMS: 23.998 Gyr



- $\bullet$   $\ell = 0$
- $\blacktriangle$   $\ell = 1$
- $\blacksquare$   $\ell = 2$
- $\blacklozenge$   $\ell = 3$

$$a_0 = -3.6328 \mu \text{ Hz}$$

$$a_1 = 0.0032312$$

$$a_2 = -6.5441e-07 \mu \text{ Hz}^{-2}$$

$$c_0 = 0.0033429$$

$$c_2 = 6.049e-07 \mu \text{ Hz}^{-2}$$

$$\tau_{\text{HeII}} = 873.6 \text{ s}$$

$$\phi_{\text{HeII}} = 4.9947$$

$$b_2 = 1.0299e+06 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 3138.9 \text{ s}$$

$$\phi_{\text{CZ}} = 0.59942$$

$$d_0 = 0.0019363$$

$$d_2 = 9.2786e-07 \mu \text{ Hz}^{-2}$$

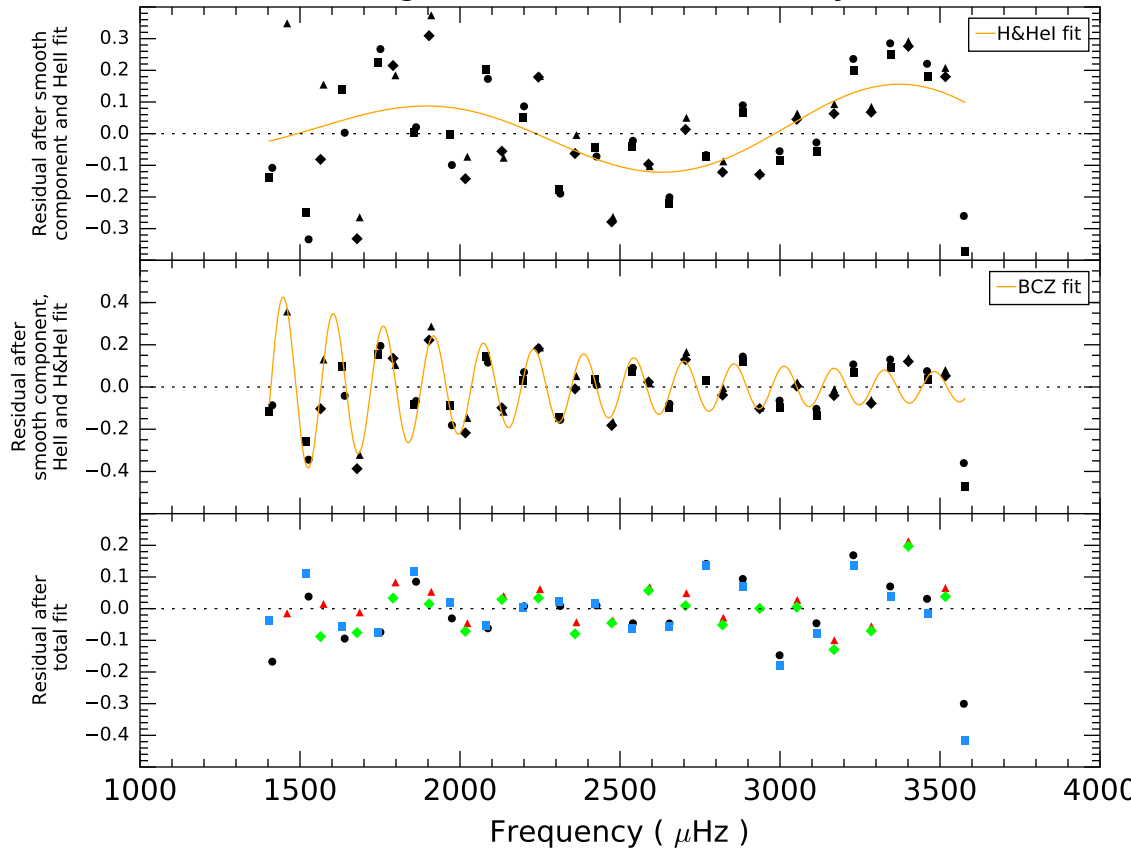
$$\tau_{\text{HI}} = 343.32 \text{ s}$$

$$\phi_{\text{HI}} = 5.2156$$

profile98

$$\chi^2_{\nu}(\text{dof} = 65) = 0.015211$$

# Age after ZAMS: 24.070 Gyr



$$a_0 = -5.4498 \mu \text{ Hz}$$

$$a_1 = 0.0047907$$

$$a_2 = -9.7378e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.0030623$$

$$c_2 = 6.0921e-07 \mu\text{Hz}^{-2}$$

$$\tau_{HeII} = 892.0 \text{ s}$$

$$\phi_{HeII} = 4.8095$$

$$b_2 = 8.9169e+05 \text{ mHz}^3$$

$$\tau_{CZ} = 3194.1 \text{ s}$$

$$\phi_{CZ} = 6.2832$$

$$d_0 = 4.656e-05$$

$$d_2 = 2.1674e-10 \mu\text{Hz}^{-2}$$

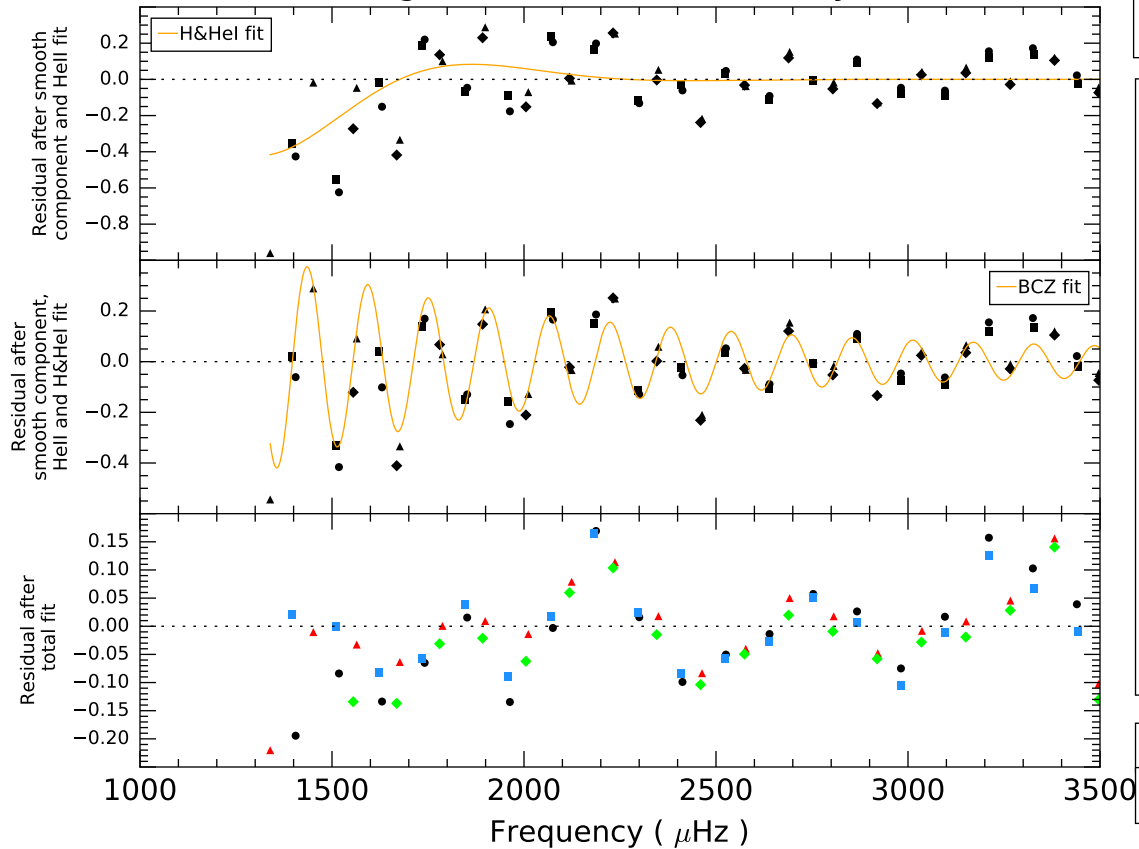
$$\tau_{HI} = 335.21 \text{ s}$$

$$\phi_{HI} = 6.2828$$

profile99

$$\chi^2_{\nu}(\text{dof} = 63) = 0.011586$$

Age after ZAMS: 24.138 Gyr



- $\ell = 0$
- ▲  $\ell = 1$
- $\ell = 2$
- ◆  $\ell = 3$

$$a_0 = -3.5697 \mu \text{ Hz}$$

$$a_1 = 0.0032641$$

$$a_2 = -6.7667e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.00299$$

$$c_2 = 5.88e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 914.9 \text{ s}$$

$$\phi_{\text{HeII}} = 4.4435$$

$$b_2 = 7.7223e+05 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 3170.9 \text{ s}$$

$$\phi_{\text{CZ}} = 0.90174$$

$$d_0 = 0.0021329$$

$$d_2 = 1.0616e-06 \mu\text{Hz}^{-2}$$

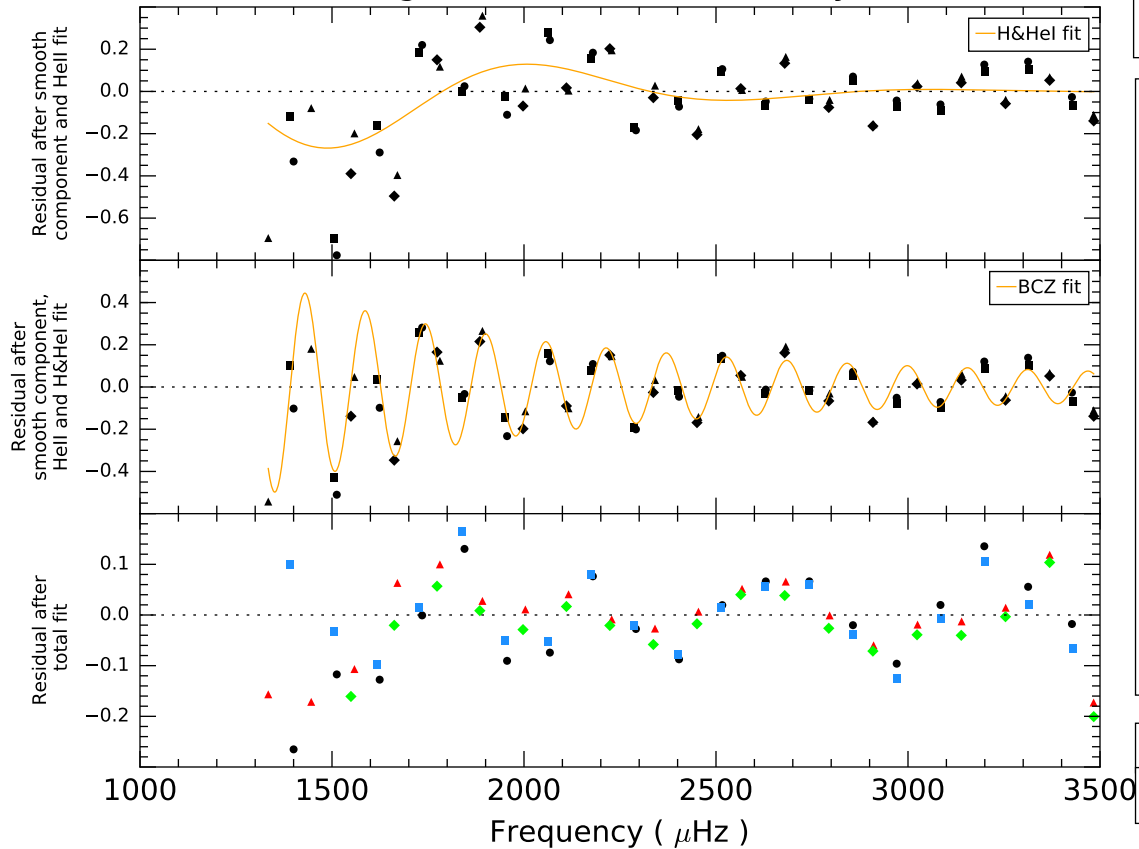
$$\tau_{\text{HI}} = 421.32 \text{ s}$$

$$\phi_{\text{HI}} = 3.6926$$

profile100

$$\chi^2_{\nu}(\text{dof} = 62) = 0.0081118$$

Age after ZAMS: 24.182 Gyr



$$a_0 = -3.4122 \mu \text{ Hz}$$

$$a_1 = 0.0031262$$

$$a_2 = -6.4837e-07 \mu\text{Hz}^{-2}$$

$$c_0 = 0.002845$$

$$c_2 = 6.0844e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HeII}} = 953.63 \text{ s}$$

$$\phi_{\text{HeII}} = 3.6403$$

$$b_2 = 9.0953e+05 \text{ mHz}^3$$

$$\tau_{\text{CZ}} = 3188.4 \text{ s}$$

$$\phi_{\text{CZ}} = 0.81475$$

$$d_0 = 0.00062134$$

$$d_2 = 5.5212e-07 \mu\text{Hz}^{-2}$$

$$\tau_{\text{HI}} = 462.08 \text{ s}$$

$$\phi_{\text{HI}} = 2.1895$$

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$$\chi^2_{\nu}(\text{dof} = 62) = 0.0085226$$