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Oscillation frequencies of two Delta Scuti stars; KIC 4077032 and KIC 8623953

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Delta Scuti stars are intrinsic pulsating stars located where the instability strip crosses the main sequence of the Hertzsprung Russell (HR) diagram. The main pulsation period of Delta scuti stars is less than one day and typical mass range is 1.5 – 2.5 solar mass. Delta scuti stars show a very complex pulsation nature with a prominent radial pulsation mode called the fundamental radial mode and more complex non-radial asymmetric pulsations modes. One-minute exposure short cadence Kepler light curves of KIC 8623953 and KIC 4077032 obtained through *Kepler Asteroseismic Science Operations Center (*KASOC) data were analyzed to determine the oscillation frequencies of these two stars. Nine dominant independent oscillation frequencies were found in KIC 4077032 with a radial fundamental frequency of 93.031±0.003 μHz which is denoted by *l* = 0 in three dimensional stellar oscillations. The pulsation constant, Q, for fundamental radial modes of Delta Scuti stars has a well-defined range $0.0327 \leq Q \leq 0.0332$. The determined Q value, 0.0330, for the frequency 93.031 μHz is confirmed the existence of this fundamental radial mode of KIC 4077032. Among the set of frequencies, several non-radial oscillation frequencies were observed. 167.613±0.004 μHz was identified as non-radial dipole mode, which is denoted by *l* = 1. This dipole mode is confirmed by observing two almost equally spaced peaks detected alongside at 171.280±0.004 μHz and at 162.724±0.004 μHz. The Delta Scuti star, KIC 8623953, consists of relatively higher frequencies in its frequency spectrum. Among the 10 dominant frequencies with relatively higher amplitudes, none of the frequency is consistent with the range of Q value of fundamental radial mode. Nevertheless, a frequency, 135.877±0.006 μHz with relatively low amplitude, results pulsation constant, Q of 0.0320 which is close to the range of fundamental radial mode. Along with the set of independent frequencies, we noticed that the frequency of the highest amplitude, 315.475±0.005 μHz has two equally spaced peaks at 335.022±0.005 μHz and 298.864±0.005 μHz. This combination was identified as presence of non-radial mode with *l* = 1.

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