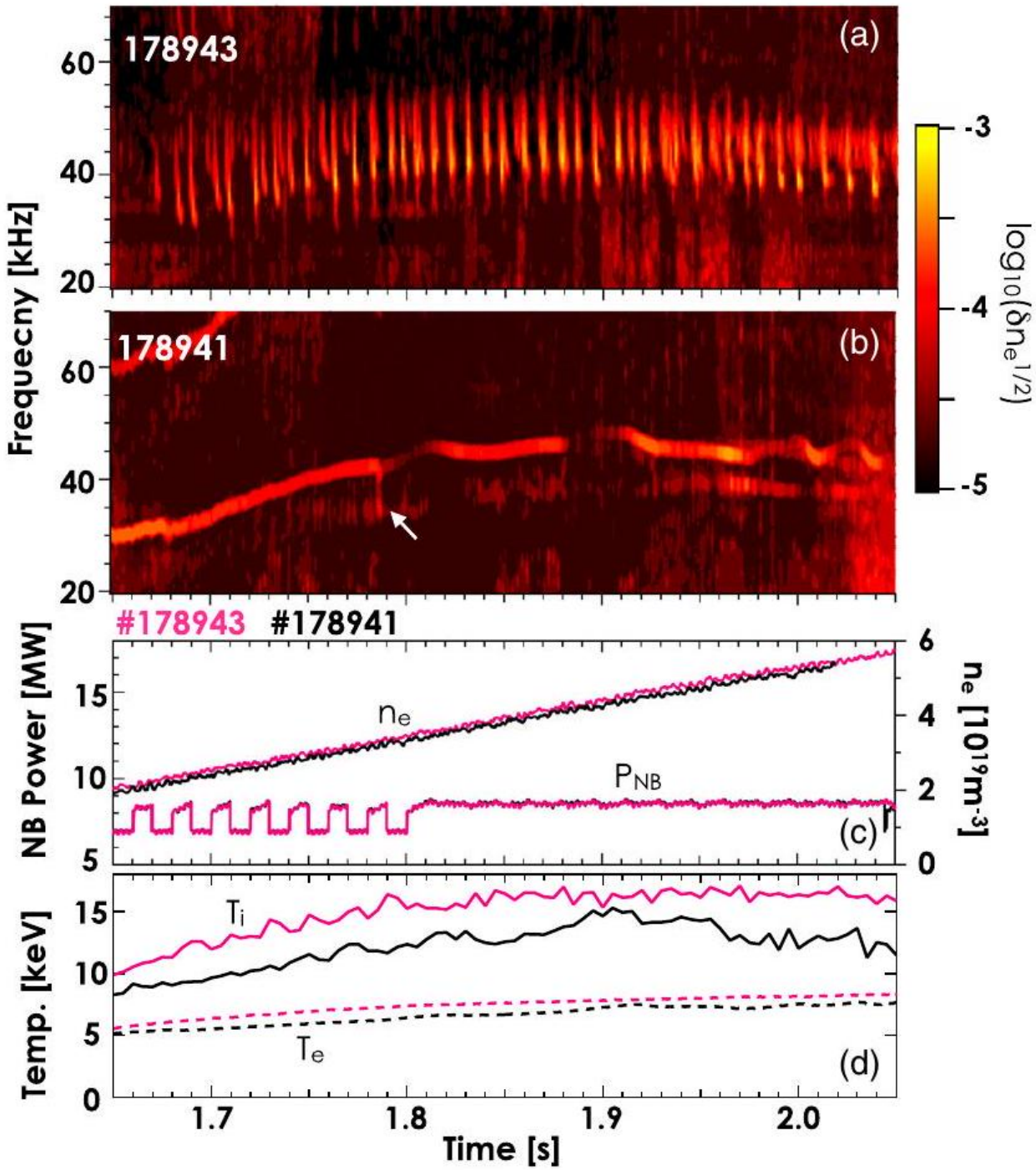

Figure 1: *Frequency spectra of the density fluctuations for shot No. 178943 and No. 178941 are shown in (a) and (b), respectively. The time evolutions of the line-averaged plasma density and neutral beam power in (c) and ion temperature (solid line) and electron temperature (dashed line) near the magnetic axis in (d) for shot No. 178943 (red) and No. 178941 (black).*

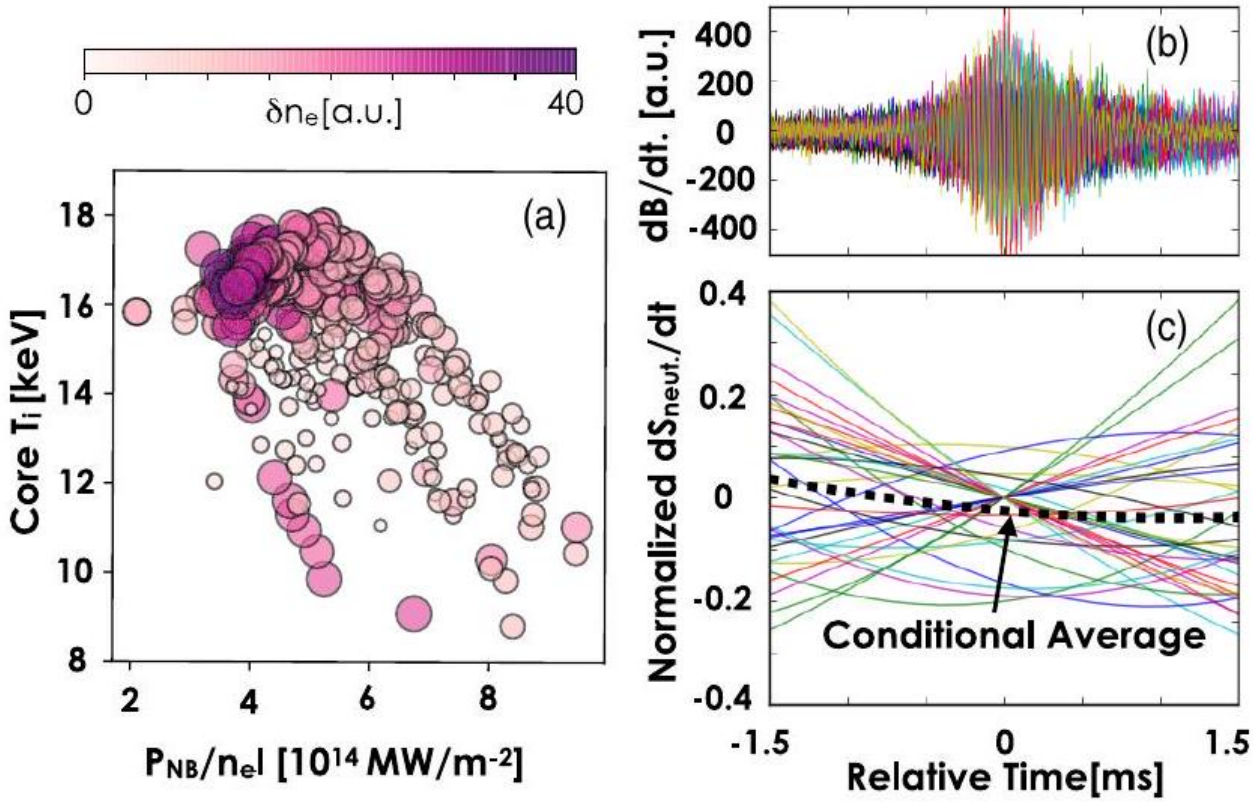

Figure 2: *(a) Dependence of chirping mode amplitude on the neutral beam power normalized by the electron density ($\propto \beta_f$) and the core T_i. The magnetic perturbations of 34 randomly sampled bursts (b) and corresponding time derivative of the neutron flux (c) are overlaid. The conditional averaged dS_{neut}/dt is given as the dashed line in (c).*

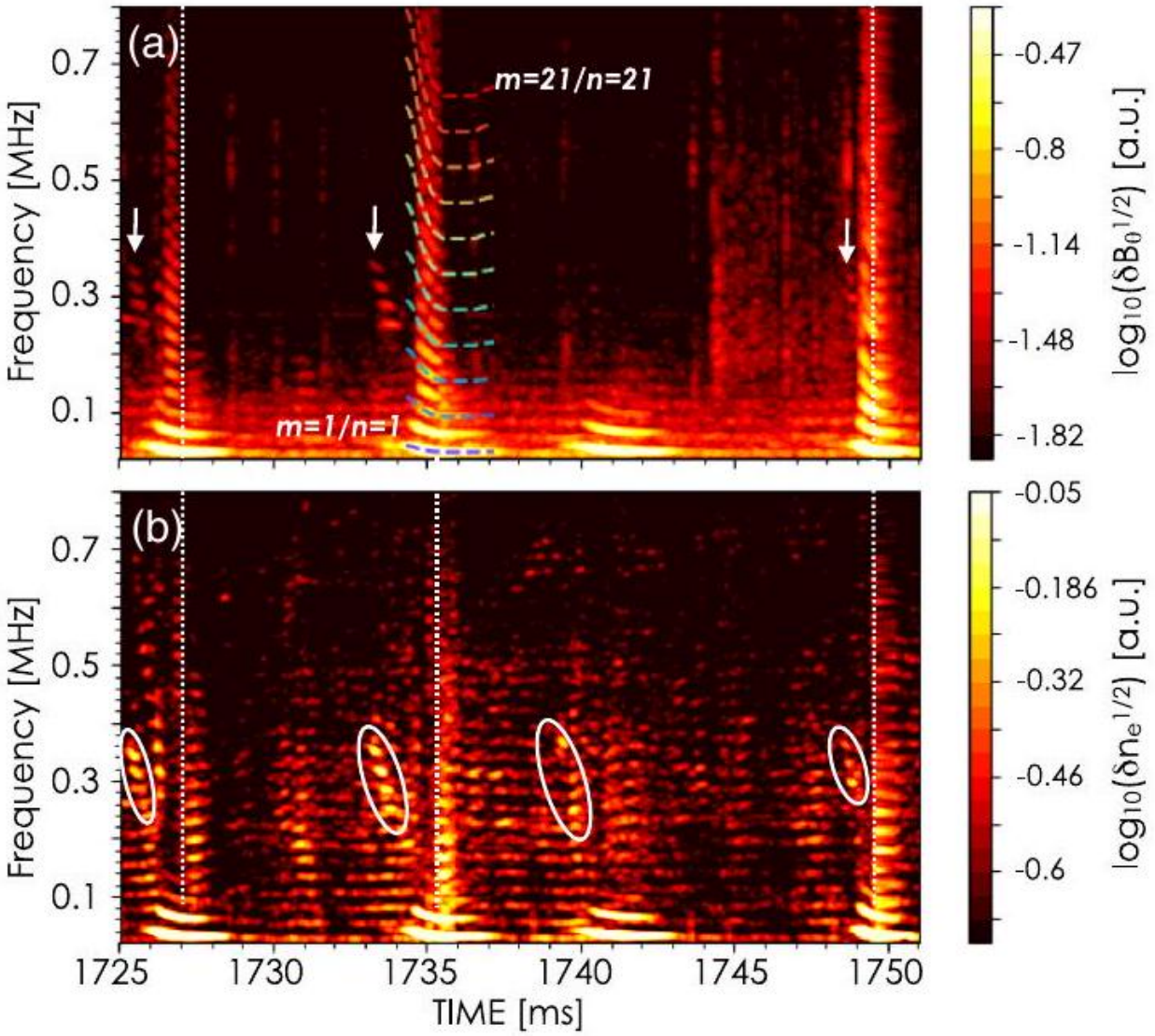

Figure 3: *Frequency spectra of the magnetic fluctuation at the plasma boundary (a) and density fluctuation spectra around the* $q = 1$ *flux surface (b) in shot No. 178942 .*

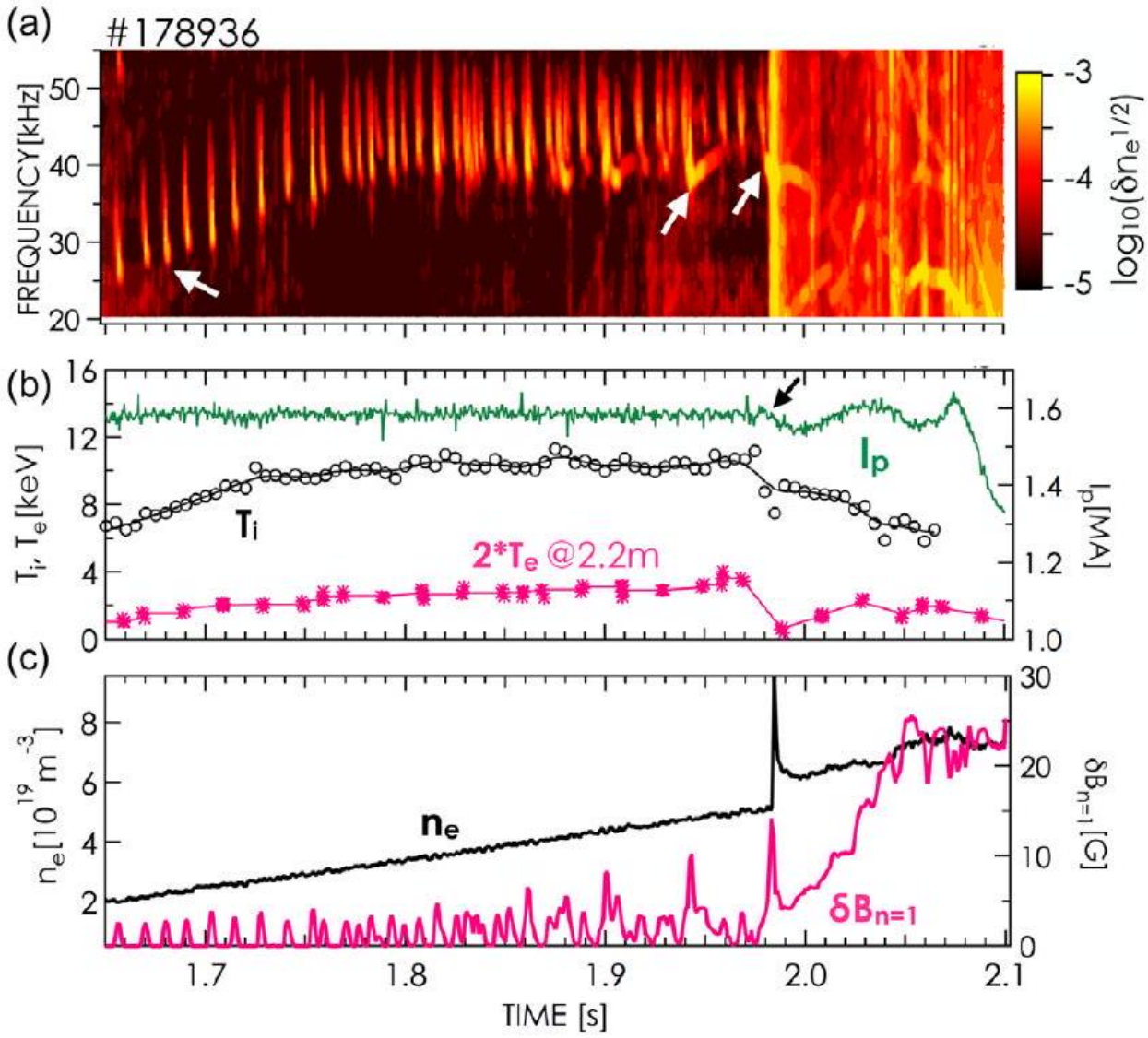

Figure 4: *(a) Frequency spectra of density fluctuation measured by a* CO_2 *interferometer. Time evolution of plasma current, ion temperature near the* $q = 1$ *flux surface and electron temperature at* $R = 2.2$ m *in (b), volume-averaged electron density and integrated magnetic fluctuation of* $n = 1$ *in (c).*

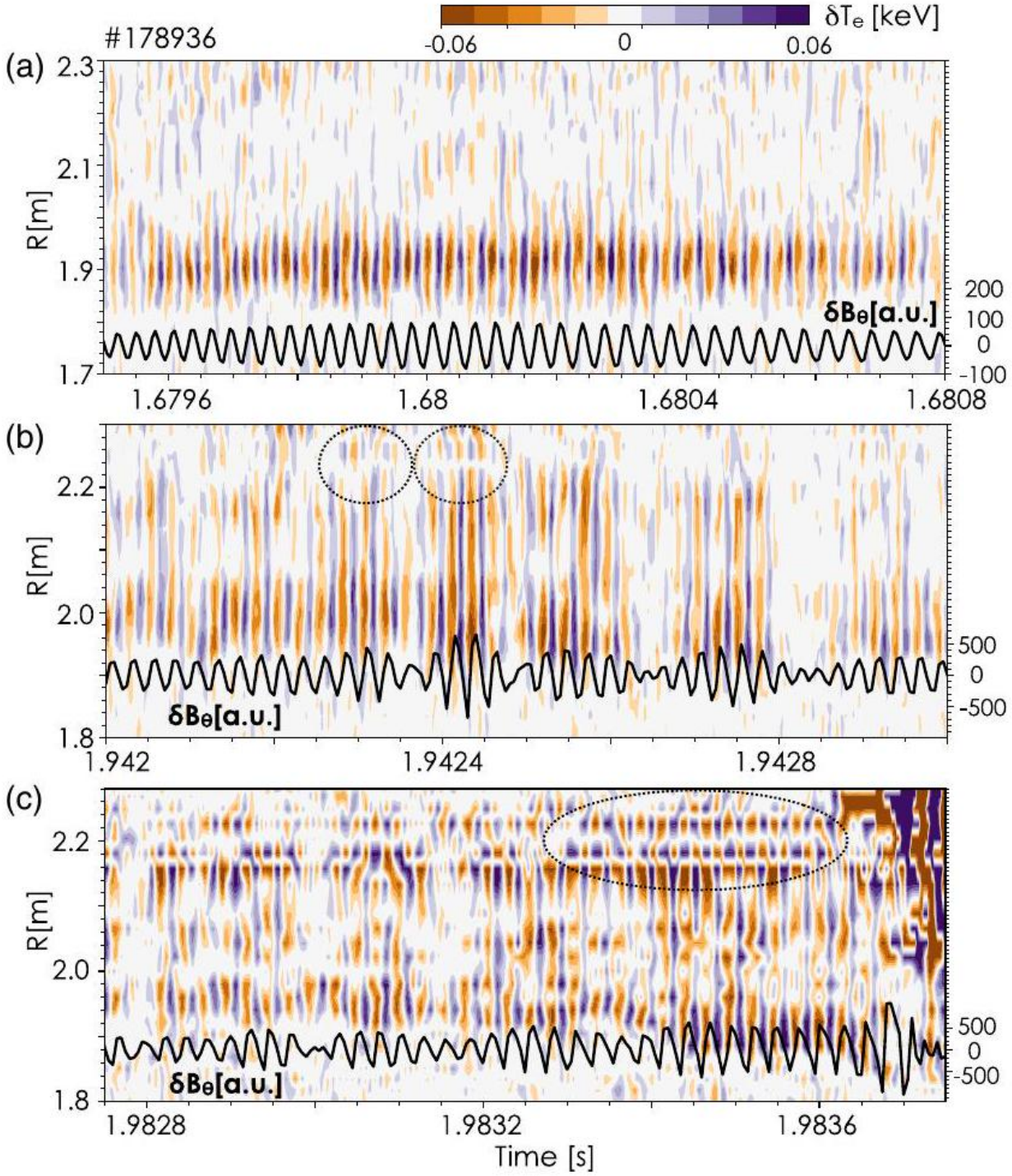

Figure 5: *Time evolutions of the electron temperature fluctuations of the three chirping modes [marked by the three arrows in Fig. 4(a)] at* ~ 1.678 s, ~ 1.942 s*, and* ~ 1.983 s *in (a)-(c), respectively. The evolution of the magnetic probe signals are overlaid together. Note that although the optical thickness outside* ~ 2.24 m *in Fig. 3(c) is thin, synthetic electron cyclotron emission suggests that the fluctuation is dominated by the* $\tilde{T}_e$.

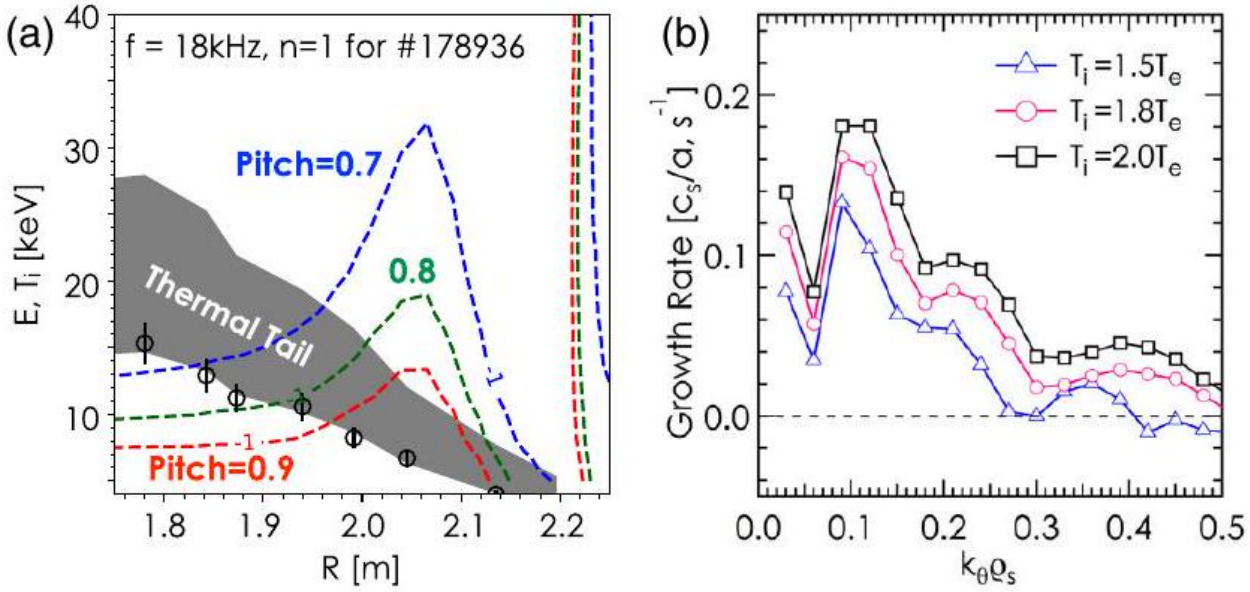

Figure 6: *(a) The resonance lines in energy- R space at the midplane for pitch 0.7 (blue), 0.8 (green), and 0.9 (red). The measured T_i is represented by the circles and its high-energy thermal tail is indicated by the shaded band. (b) The growth rate (normalized by the ion sound speed, c_s) of AITG over a range of the $k_\theta \rho_s$ for fixed β_e, where $\rho_s \equiv (m_i T_e)^{0.5}/eB$. In experiment, T_i is $1.8T_e$ at the $q = 1$ flux surface.*