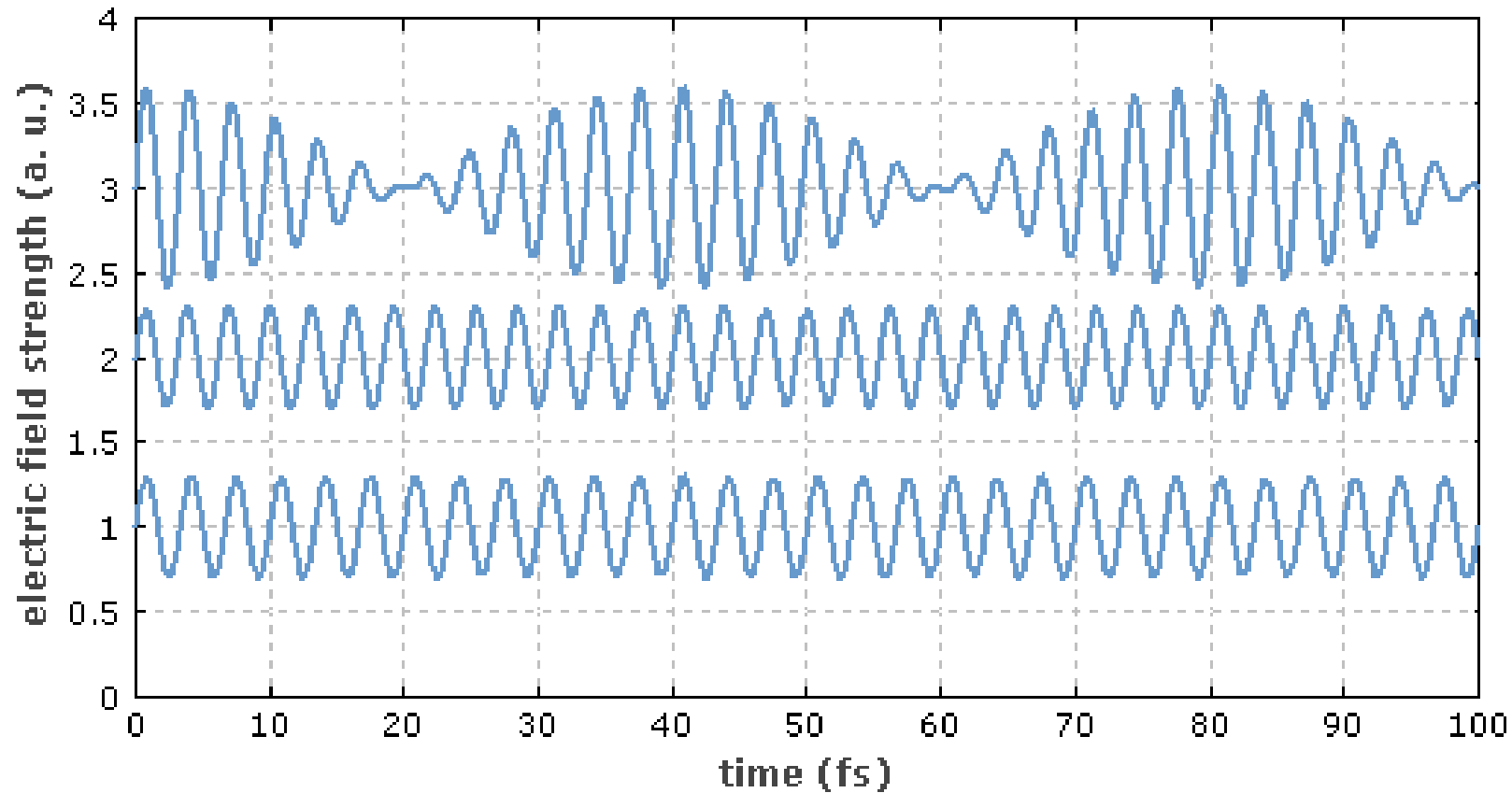
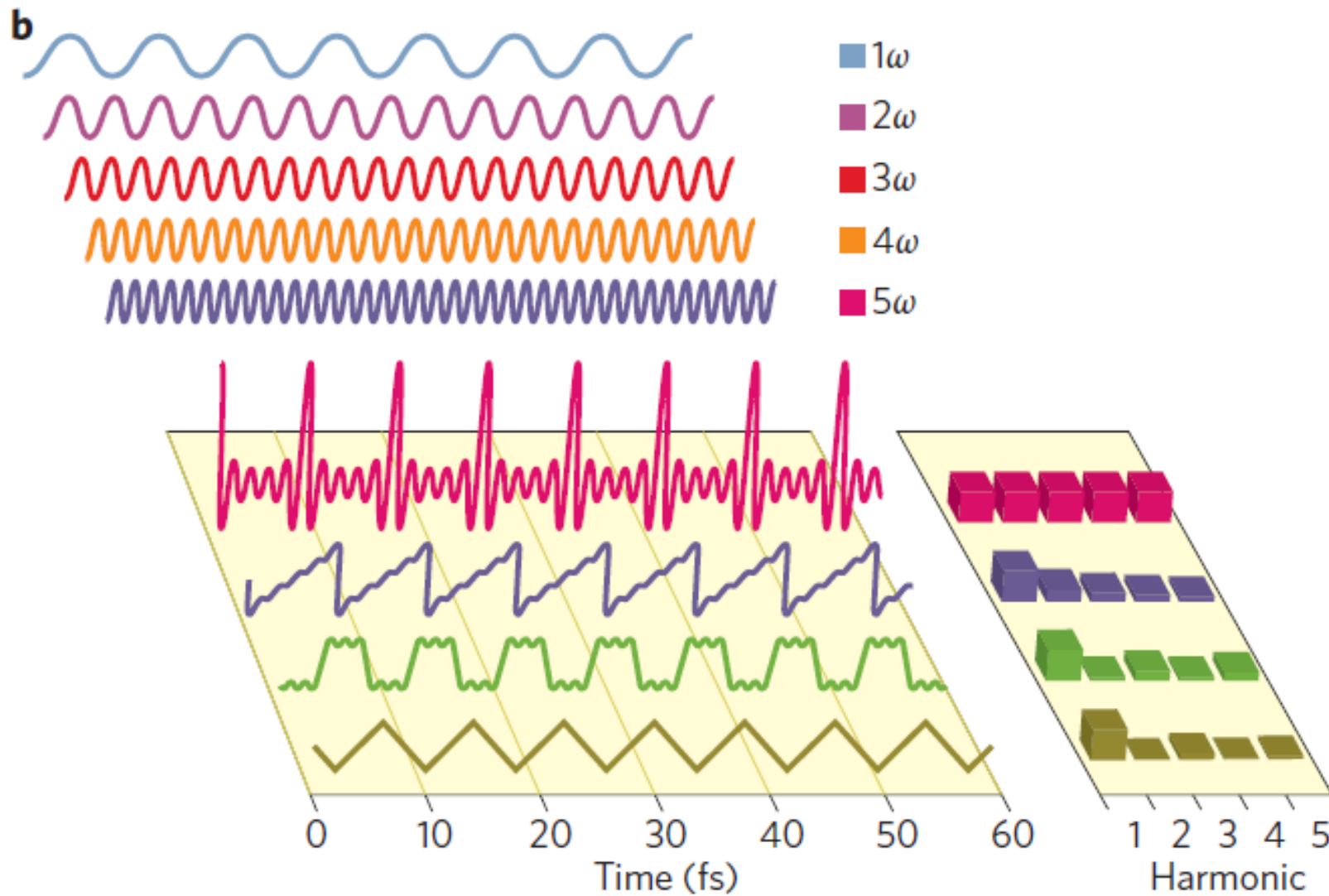


Pulse Synthesis



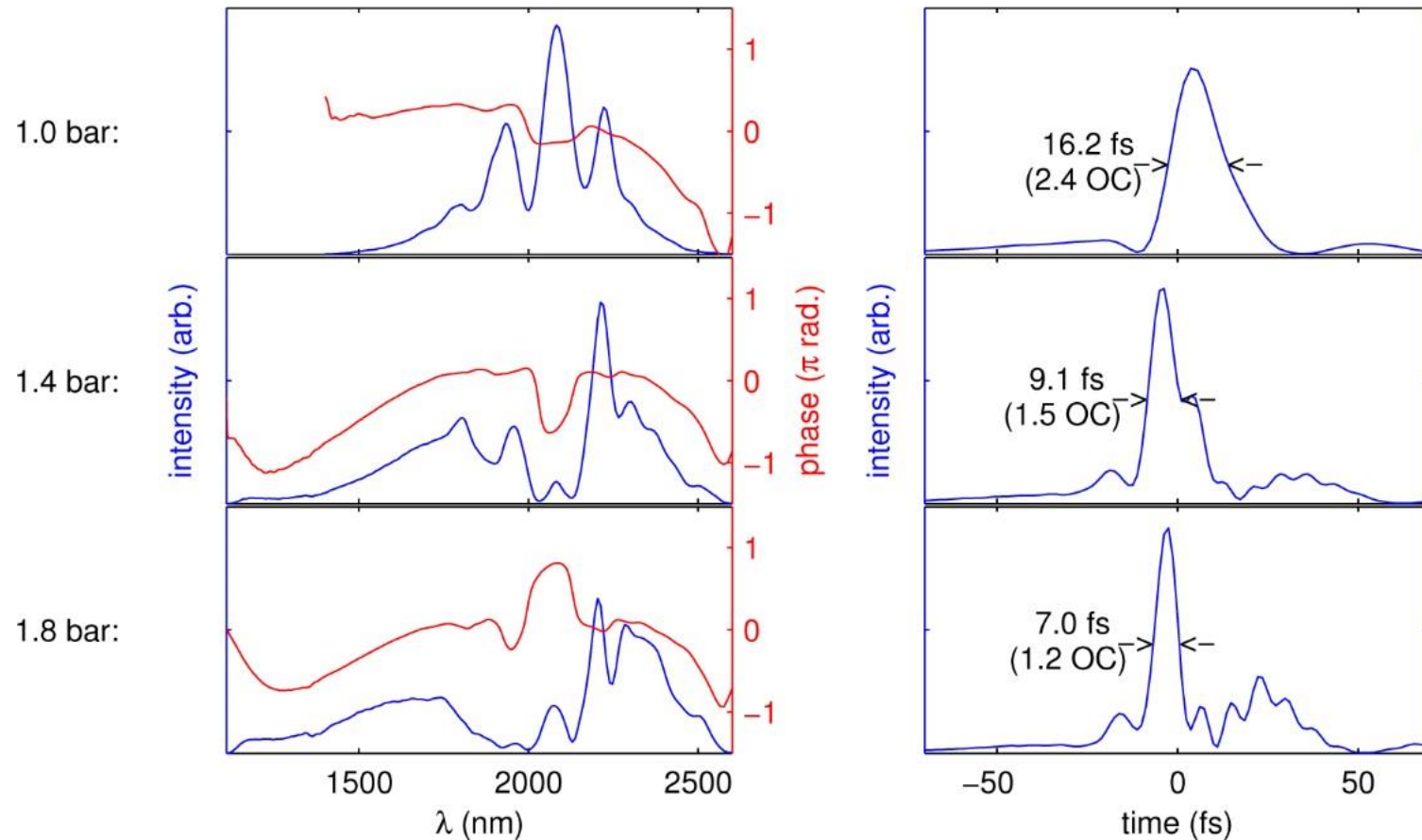
A beat note at $(\omega_1 - \omega_2)$ is synthesized from two continuous monochromatic fields of frequency ω_1 and ω_2



A periodic waveform with high temporal resolution features can be synthesized from multiple octave spanning components of a superposition of fields (e.g. here from integer multiples of the fundamental frequency ω)

From Fourier analysis theory we can derive the **bandwidth theorem**, relating the fastest time resolution feature duration $\Delta\tau$ to the frequency bandwidth available $\Delta\nu$:

$$\Delta\tau \Delta\nu \geq \text{constant} \quad (\text{where constant} \approx 0.5 \text{ and depends upon the details of the spectrum})$$



This is illustrated (for a complex spectrum) in results recently published from our lab (OE, 24, 024786 (2016))