beam, we measure the cross-correlation between the two beams via a photodiode and lock-in amplifier.

To control the temperature of the Rubidium vapor, we place the vapor cell in a cylindrical enclosure with anti-reflection coated windows. We heat the cell using ceramic heaters and insulate using fiberglass around the body of the cell; we do not directly heat the vapor cell cold finger. We independently monitor the temperature at the cold finger and the front and back faces via K-type thermocouples, and ensure that the cold finger is always 20 °C colder than the faces of the cell so that Rubidium does not condense on the cell walls. This setup allows us to vary the cold finger temperature between 18 and 350 °C. Finally, to account for any temperature-dependent changes in the index of refraction of the cell or air in the heated enclosure, we repeat the experiments for an empty vapor cell. Thus, our measurements depend only on the optical properties of the Rubudium vapor.

4. Results and discussion

To validate our model, we begin by comparing the theoretically-predicted and experimentally-measured group delays. Figure 2 a) shows the wavelength dependence of the group delay across the D1 and D2 transitions (measured via a monochromatic source) for a cell temperature of 280 °C. In agreement with the model, we measure large (∼250 ps) and rapidly-varying delays near the resonances, and smaller (∼10 ps) but uniform delays between the resonances. To highlight the uniform broadband slow light region, Fig. 2 b) shows an expanded view of the group delay between 784 and 792 nm. The group index varies by less than 50% over 6 nm and has a minimum at λ_c (*i.e.*, the point where GVD= 0).

Next, we compare the experimental results for pulse propagation through the vapor with the model predictions. Figure 3 shows the shape of pulses after they have passed through a 7 cm length of the atomic vapor. The amplitude is obtained, as described in Sec. 3, via a cross-correlation measurement with a temporally short reference beam, and we scale the results such that a pulse propagating through vacuum has a peak amplitude of 1 and an arrival of its