Supporting Information for

Active tuning electromagnetically induced transparency from chalcogenide-only metasurface

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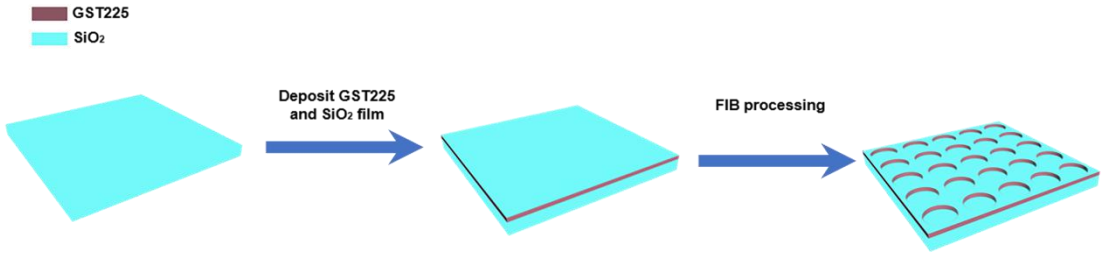

Fig. S1. The flowchart of the fabrication processing.

Table S1. Fitting parameters

	ω_E	ω_M	Π_E	Π_M	κ
AD-AM	247.8	214.4	0.4135	0.02985	0.1864
CR	169.4	173.5	0.2682	0.06255	0.1371

In order to explore the nature of the induced modes, we perform the multipole decomposition to evaluate cartesian multipole contributions into the scattering for the single nanohole. The five multipole moments are relied on the current density ($\vec{j} = -i\omega\varepsilon_0(n^2-1)\vec{E}$) distribution inside the nanohole and expressed by the formula[80],

$$\vec{P} = \frac{1}{i\omega}\int \vec{j}\, d^3r \quad \text{(s1)}$$

$$\vec{M} = \frac{1}{2c}\int (\vec{r} \times \vec{j})d^3r \quad \text{(s2)}$$

$$\vec{T} = \frac{1}{10c}\int [(\vec{r} \cdot \vec{j})\vec{r} - 2r^2\vec{j}]d^3r \quad \text{(s3)}$$

$$\vec{Q}^{(e)}_{\alpha\beta} = \frac{1}{2i\omega}\int [r_\alpha j_\beta + r_\beta j_\alpha - \frac{2}{3}(\vec{r} \cdot \vec{j})\delta_{\alpha,\beta}]d^3r \quad \text{(s4)}$$

$$\vec{Q}^{(m)}_{\alpha\beta} = \frac{1}{3c}\int [(\vec{r} \times \vec{j})_\alpha r_\beta + [(\vec{r} \times \vec{j})_\beta r_\alpha]]d^3r \quad \text{(s5)}$$

where ω is angular frequency, ε_0 the permittivity in vacuum, n the complex refractive index, $\vec{E}$ the electric field, c the vacuum light speed. where $\alpha, \beta, \gamma = x, y, z$. The $\vec{P}$, $\vec{M}$, $\vec{T}$, $\vec{Q}^{(e)}$, $\vec{Q}^{(m)}$represent the electric dipole (ED) moment, magnetic dipole (MD) moment, toroidal dipole (TD) moment, electric quadrupole (EQ) moment, and magnetic quadrupole (MQ) moment, respectively. The scattered powers of the multipole moments can be calculated from

$$I_P = \frac{2\omega^4}{3c^3}|\vec{P}|^2 \quad \text{(s6)}$$

$$I_M = \frac{2\omega^4}{3c^3}|\vec{M}|^2 \quad \text{(s7)}$$

$$I_T = \frac{2\omega^6}{3c^5}|\vec{T}|^2 \quad \text{(s8)}$$

$$I_{Q^{(e)}} = \frac{\omega^6}{5c^5}\sum |\vec{Q}^{(e)}_{\alpha\beta}|^2 \quad \text{(s9)}$$

$$I_{Q^{(m)}} = \frac{\omega^6}{40c^5}\sum |\vec{Q}^{(m)}_{\alpha\beta}|^2 \quad \text{(s10)}$$