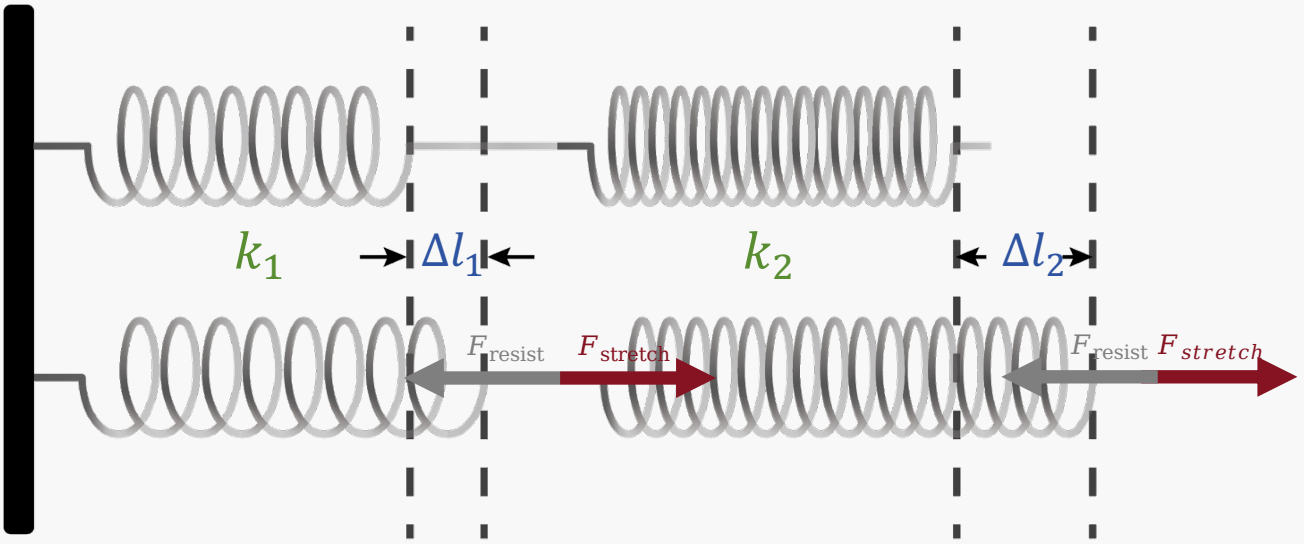
Our Contribution: The *Elasticity* of LLMs

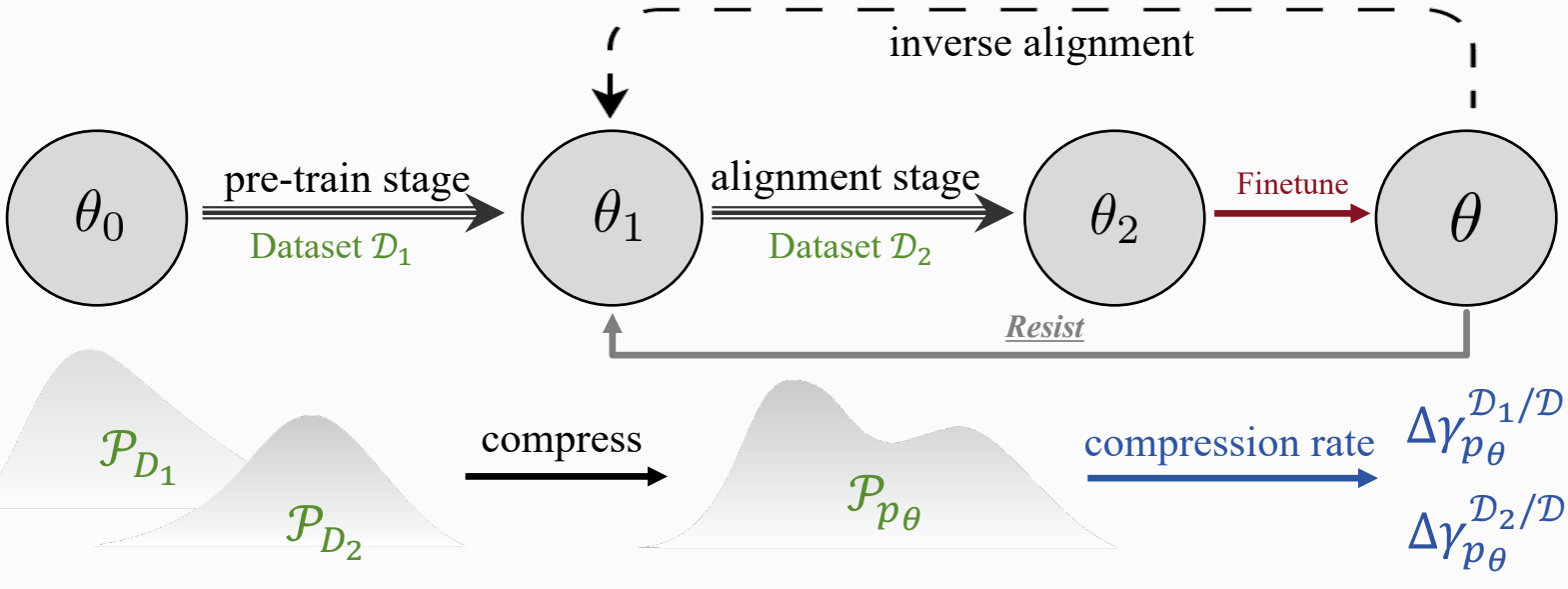
Language models, fine-tuned with perturbations, exhibit an inverse relationship between normalized compression rate changes and dataset volume, akin to that of a series spring system, revealing the *elasticity* of LLMs.



$$k_1 \cdot \Delta l_1 = k_2 \cdot \Delta l_2$$

Physical Model: The Hooke's Law

$$|\mathcal{D}_1| \cdot \Delta\gamma_{p_\theta}^{\mathcal{D}_1/\mathcal{D}} = \Theta(|\mathcal{D}_2| \cdot \Delta\gamma_{p_\theta}^{\mathcal{D}_2/\mathcal{D}})$$



Compression Model: The *Elasticity* of LLMs