

$$\begin{array}{ccccc}
 \Delta \times \Delta & \xrightarrow{\gamma_\Delta \times \gamma_\Delta} & \mathbf{sSet} \times \mathbf{sSet} & \xrightarrow{\times} & \mathbf{sSet} \\
 \downarrow \oplus & & \swarrow & \nearrow & \\
 \Delta & & \text{sd} & & \\
 \downarrow \gamma_\Delta & & \swarrow & \nearrow & \\
 \mathbf{sSet} & & \text{Sd} & & 
 \end{array}$$

A commutative diagram illustrating the relationship between simplicial sets and their geometric realizations. The diagram shows the following components and maps:

- Top Row:**  $\Delta \times \Delta \xrightarrow{\gamma_\Delta \times \gamma_\Delta} \mathbf{sSet} \times \mathbf{sSet} \xrightarrow{\times} \mathbf{sSet}$
- Left Column:**  $\Delta \times \Delta \xrightarrow{\oplus} \Delta \xrightarrow{\gamma_\Delta} \mathbf{sSet}$
- Diagonal Maps:**
  - A double arrow labeled  $\text{sd}$  from  $\Delta$  to  $\mathbf{sSet}$ .
  - A double arrow labeled  $\text{Sd}$  from  $\mathbf{sSet}$  to  $\mathbf{sSet}$ .
  - A curved arrow from  $\Delta$  to  $\mathbf{sSet}$ .
  - A curved arrow from  $\mathbf{sSet}$  to  $\mathbf{sSet}$ .