

$$\begin{array}{ccccccc}
0 & \longrightarrow & A^p & \xrightarrow{f^p} & B^p & \xleftarrow{g^p} & C^p \longrightarrow 0 \\
& & \searrow d_A^p & & \searrow d_B^p & & \searrow d_C^p \\
& & \downarrow & & \downarrow & & \downarrow \\
0 & \longrightarrow & A^{p+1} & \xrightarrow{f^{p+1}} & B^{p+1} & \xrightarrow{g^{p+1}} & C^{p+1} \longrightarrow 0 \\
& & \searrow d_A^{p+1} & & \searrow d_B^{p+1} & & \searrow d_C^{p+1} \\
& & \downarrow & & \downarrow & & \downarrow \\
0 & \longrightarrow & A_1^p & \xrightarrow{f_1^p} & B_1^p & \xleftarrow{g_1^p} & C_1^p \longrightarrow 0 \\
& & \searrow d_{A_1}^p & & \searrow d_{B_1}^p & & \searrow d_{C_1}^p \\
& & \downarrow & & \downarrow & & \downarrow \\
0 & \longrightarrow & A_1^{p+1} & \xrightarrow{f_1^{p+1}} & B_1^{p+1} & \xrightarrow{g_1^{p+1}} & C_1^{p+1} \longrightarrow 0
\end{array}$$

Detailed description of the commutative diagram:

- Top Row:**  $0 \rightarrow A^p \xrightarrow{f^p} B^p \xleftarrow{g^p} C^p \rightarrow 0$ . Dotted arrows from  $A^p$  to  $B^p$  and  $B^p$  to  $C^p$  are labeled  $d_A^p$  and  $d_B^p$  respectively.
- Second Row:**  $0 \rightarrow A^{p+1} \xrightarrow{f^{p+1}} B^{p+1} \xrightarrow{g^{p+1}} C^{p+1} \rightarrow 0$ . Dotted arrows from  $A^{p+1}$  to  $B^{p+1}$  and  $B^{p+1}$  to  $C^{p+1}$  are labeled  $d_A^{p+1}$  and  $d_B^{p+1}$  respectively.
- Third Row:**  $0 \rightarrow A_1^p \xrightarrow{f_1^p} B_1^p \xleftarrow{g_1^p} C_1^p \rightarrow 0$ . Dotted arrows from  $A_1^p$  to  $B_1^p$  and  $B_1^p$  to  $C_1^p$  are labeled  $d_{A_1}^p$  and  $d_{B_1}^p$  respectively.
- Bottom Row:**  $0 \rightarrow A_1^{p+1} \xrightarrow{f_1^{p+1}} B_1^{p+1} \xrightarrow{g_1^{p+1}} C_1^{p+1} \rightarrow 0$ . Dotted arrows from  $A_1^{p+1}$  to  $B_1^{p+1}$  and  $B_1^{p+1}$  to  $C_1^{p+1}$  are labeled  $d_{A_1}^{p+1}$  and  $d_{B_1}^{p+1}$  respectively.
- Vertical Maps:**
  - $\alpha^p: A^p \rightarrow A_1^p$ ,  $\alpha^{p+1}: A^{p+1} \rightarrow A_1^{p+1}$
  - $\beta^p: B^p \rightarrow B_1^p$ ,  $\beta^{p+1}: B^{p+1} \rightarrow B_1^{p+1}$
  - $\gamma^p: C^p \rightarrow C_1^p$ ,  $\gamma^{p+1}: C^{p+1} \rightarrow C_1^{p+1}$
- Commutativity:** The diagram is commutative, with solid arrows forming a grid and dotted arrows representing the differentials  $d$ .