

$$\begin{array}{ccc}
 A^n & \xrightarrow{F_n(f)} & A \\
 (\varphi, \varphi, \dots, \varphi) \downarrow & & \downarrow \varphi \\
 B^n & \xrightarrow{G_n(f)} & B
 \end{array}$$