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**module coalgebra**

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Let  $H$  be a bialgebra. A **left  $H$ -module coalgebra** is a coalgebra  $A$  which is a left  $H$ -module with action  $h \triangleright a$  satisfying

$$\Delta(h \triangleright a) = \sum (h_{(1)} \triangleright a_{(1)}) \otimes (h_{(2)} \triangleright a_{(2)}), \quad \varepsilon(h \triangleright a) = \varepsilon(h)\varepsilon(a), \quad (1)$$

for all  $h \in H$  and  $a \in A$ .

There is a dual notion of a  $H$ -comodule algebra.

**Example 1**

*Let  $H$  be a bialgebra. Then  $H$  is itself a  $H$ -module coalgebra for the left regular action  $g \triangleright h = gh$ .*