So consider

$$V = a(u,v)\,\underline{x}_u + b(u,v)\,\underline{x}_v$$

↑ vector field on surface.

write X for some Tangent vector at a point (or T. vec. field)

[Directional derivative of V in Dir X] ← may not be tangent

[Example next page]

$$\overset{\shortparallel}{D_X V}$$

But

$$\nabla_X V = [\text{take directional derivative then PROJECT to tangent space}]$$

is Tangent.