An analytical formula is derived for the electric field gradient (EFG) of a thin slab with an arbitrary charge density in the $x$-$y$-plane without $z$-dispersion, based on its Fourier expansion. It turns out that the EFG is dominated by the leading Fourier-coefficients for thin slabs and reduces to a contact-term proportional to the charge density at the nucleus in the truly two-dimensional case. An extension to charge density distributions which are factorizable into a function $f(x, y)$ and $g(z)$ is given with an example for a Gaussian $g(z)$. The consequences for EFGs in layered compounds such as TaS$_2$ and TaSe$_2$ are discussed.

**Key words:** Electric Field Gradients; Layered Compounds.