<u>Manin Triple</u> A triple $(\mathfrak{g}, \mathfrak{g}_+, \mathfrak{g}_-)$ of f.d. Lie algebras where $\mathfrak{g}$ has a non-degenerate invariant bilinear forms s.t.

1. $\mathfrak{g}_+, \mathfrak{g}_-$ are Lie-subalgebras of $\mathfrak{g}$.
2. $\mathfrak{g}_+ \oplus \mathfrak{g}_- = \mathfrak{g}$ as v.s.
3. $\langle \mathfrak{g}_+, \mathfrak{g}_+ \rangle = \langle \mathfrak{g}_-, \mathfrak{g}_- \rangle = 0$.

[Easy to show that $\mathfrak{g}_+$ and $\mathfrak{g}_-$ are maximally isotropic and half dimensional]

<u>Claim</u> $\mathfrak{g}_+$ in this case is a Lie-bialgebra, using the duality of $\mathfrak{g}_+$ & $\mathfrak{g}_-$ (via $\langle \cdot, \cdot \rangle$) to construct a co-bracket on $\mathfrak{g}_+$ from the bracket of $\mathfrak{g}_-$.

There is a likewise construction taking an LBA $\mathfrak{g}_+$ to a Manin triple $(\mathfrak{g} := \mathfrak{g}_+ \oplus \mathfrak{g}_-, \mathfrak{g}_+, \mathfrak{g}_- := (\mathfrak{g}_+)^*)$.
