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Corrigendum to 'On the Killing vector fields of generalized metrics' (in SUT Journal of Mathematics, Vol. 40, No. 2 (2004), 133 – 156)

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In §9, the Killing vector fields of Poincaré's hyperbolic upper half-plane model should have the form

$$X = \left[\alpha\left((u^1)^2 - (u^2)^2\right) + \beta u^1 + \gamma\right]\frac{\partial}{\partial u^1} + \left(2\alpha u^1 + \beta\right)u^2\frac{\partial}{\partial u^2}$$

with some $\alpha, \beta, \gamma \in \mathbb{R}$. The upper half-plane may be identified with the set of complex numbers with positive imaginary part. Suppose that $\alpha \neq 0$, and introduce the notation $k := \sqrt{|\beta^2/4 - \alpha\gamma|}$. Then the integral curves of X are given by

$$\begin{aligned}
z(t) &= -\frac{k}{\alpha}\frac{c\cosh kt - \sinh kt}{c\sinh kt - \cosh kt} - \frac{\beta}{2\alpha} && \text{if } \frac{\beta^2}{4} - \alpha\gamma > 0,\\
z(t) &= -\frac{k}{\alpha}\frac{c\cos kt + \sin kt}{c\sin kt - \cos kt} - \frac{\beta}{2\alpha} && \text{if } \frac{\beta^2}{4} - \alpha\gamma < 0,\\
z(t) &= -\frac{1}{\alpha t + c} - \frac{\beta}{2\alpha} && \text{if } \frac{\beta^2}{4} - \alpha\gamma = 0
\end{aligned}$$

with $c \in \mathbb{C}$ such that $\operatorname{Im} c > 0$.

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