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$$\lim_{x\to 0} \sqrt{\log(1+x)}\,\log(2^x-1) =$$

$$= \lim_{x\to 0} \sqrt{\log(1+x)}\,\log\frac{2^x-1}{x}\cdot x =$$

$$= \lim_{x\to 0} \sqrt{\frac{\log(1+x)}{x}}\; x^{\frac{1}{2}\cdot\frac{3}{2}}\left(\log\frac{2^x-1}{x} + \log x\right) =$$

$$= \lim_{x\to 0} \sqrt{\frac{\log(1+x)}{x}}\left(x^{\frac{1}{2}}\log\frac{2^x-1}{x} + x^{\frac{1}{2}}\log x\right) =$$

$$= 0\left(0\,\log\log e + 0\right) = 0$$