Schwarchild-DeSitter and Anti-DeSitter Space-time and Quantum Spin Entanglement

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The effect of a static gravitational field of Schwarchild-DeSitter and anti-DeSitter on the spin entanglement without the momentum correlation has been studied for two bipartite qubits system in the case of localized wave packet particles moving in a circular motion. The Wooter concurrence is considered and it was found that the effect of the cosmological constant is more important in the triplet state than in the singlet state. Moreover, if the cosmological constant increases, we will approach more the cosmological horizon leading to a stronger curvature near the black hole and the entanglement decreases in accordance with the Hawking-unruh effect.