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## **A lift of the Seiberg-Witten equations to Kaluza-Klein 5-manifolds**

**Sondertermin**

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**Abstract:** The Seiberg-Witten equations are a pair of coupled field equations for a  $U(1)$ -gauge field and a spinor on closed, oriented Riemannian 4-manifolds  $X$  endowed with a  $\text{Spin}^c$ -structure. The Seiberg-Witten invariants defined by these equations have many applications to the differential geometry, symplectic geometry and topology of 4-manifolds. We want to apply the Kaluza-Klein construction to the Seiberg-Witten equations: The Riemannian metric and the  $U(1)$ -gauge field on the 4-manifold  $X$  can be combined to a Riemannian metric on a circle bundle  $Y$  over  $X$  and the  $\text{Spin}^c$ -structure lifts to a standard spin structure on this 5-manifold. We show that the Seiberg-Witten equations on  $X$  are equivalent to a non-linear Dirac equation for the lifted spinor on the 5-manifold  $Y$ . As an application we discuss the case where  $X$  is Kähler-Einstein and  $Y$  a Sasaki manifold.

