

Geometry and Analysis, Fall 2018

Problem sheet 2, to be discussed Friday the 14th September.

Problem 1. Let ∇ be a connection in a vector bundle $E \rightarrow M$. Show that if a section s of E vanishes along a submanifold $N \subset M$ then $\nabla_v s = 0$ for every tangent vector v to N .

Problem 2. Let ∇ be the connection in the product bundle $\mathbb{R}^2 \times \mathbb{C}$ over \mathbb{R}^2 with connection form $w(ydx - xdy)$, where w is a complex number. Compute the holonomy of ∇ around the unit circle counterclockwise.