Odd Dimensional Orbifolds

Liz Stanhope and Sean Richardson

July 22, 2018

1

Defintion 1.1. A chart $(\tilde{U}, G_U, \pi_U)$ on some orbifold is *orientable* if the group G_U consists of orientation-preserving transformations of the open set $\tilde{U} \subset \mathbb{R}^n$. An orbifold $\mathcal{O}$ is *locally orientable* if every chart on $\mathcal{O}$ is orientable. Conversely, an orbifold $\mathcal{O}$ is *locally non-orientable* if there exists a single chart on $\mathcal{O}$ that is not orientable.

Lemma 1.2. Let $\mathcal{O}$ be a locally orientable orbifold. If $\dim(\mathcal{O})$ is odd, then there exists no primary singular stratum N such that $\dim(N)$ is even. Similarly, if $\dim(\mathcal{O})$ is even, then there exists no primary singular stratum N such that $\dim(N)$ is odd.

Theorem 1.3. Consider a locally orientable orbifold $\mathcal{A}$ and a locally non-orientable orbifold $\mathcal{B}$. If $\dim(\mathcal{A}) = \dim(\mathcal{B})$ is odd, then there exists no $\mathcal{A}$ and $\mathcal{B}$ that are isospectral.