1145-VO-99 **Hemangi Shah*** (hemangimshah@hri.res.in), Chhatnag Road, Jhunsi, Allahabad, UP 211019, India. *Geometry of Asymptotically harmonic manifolds with minimal horospheres.*

(M^n, g) be a complete Riemannian manifold without conjugate points. We show that if M is also simply connected, then M is flat, provided that M is also asymptotically harmonic manifold with minimal horospheres (AHM). The (first order) flatness of M is shown by using the strongest criterion: $\{e_i\}$ be an orthonormal basis of T_pM and $\{b_{e_i}\}$ be the corresponding Busemann functions on M. Then, (1) The vector space $V = span\{b_v | v \in T_pM\}$ is finite dimensional and $\dim V = \dim M = n$. (2) $\{\nabla b_{e_i}(p)\}$ is a global parallel orthonormal basis of T_pM for any $p \in M$. Thus, M is a parallizable manifold. And (3)$F : M \to R^n$ defined by $F(x) = (b_{e_1}(x), b_{e_2}(x), \cdots, b_{e_n}(x))$, is an isometry and therefore, M is flat. Consequently, AH manifolds can have either polynomial or exponential volume growth, generalizing the corresponding result for harmonic manifolds. In case of harmonic manifold with minimal horospheres (HM), the (second order) flatness was proved by Ranjan and Shah by showing that $span\{b_v^2 | v \in T_pM\}$ is finite dimensional. (Received July 29, 2018)