

for actions of other discrete linear groups, following the method involved in the proof of Theorem 1.3. In particular, the result that all orbits of horospherical flows are dense if G/D is compact can be seen to lead to the following:

4.1. Theorem. Let $G = SL(m, \mathbb{R})$ and D be discrete subgroup of G such that G/D is compact. Let $n = m(p+q)$ where $p, q \geq 1$ and $p+q \leq m$ and consider the G -action on E^n defined by (10). Let X be the subset of E^n as in (5) and let $v = (x_1, \dots, x_p, f_1, \dots, f_q)$ be in X . Then the D -orbit of v is dense in X if and only if x_1, \dots, x_p and f_1, \dots, f_q are linearly independent.

2. If one is interested in approaching zero, rather than an arbitrary vector in E^n , one can also use certain results in dynamics which are known in a more general setting, but have weaker conclusions. An illustration of this may be found in Dani⁴.

3. One may like to relate the degree of approximation achieved to the 'size' of the matrix, (namely, how large it is, in a suitable sense) and look for optimal possibilities. The reader is referred to Dani⁸ for certain results on this question in respect of the approach to zero in Theorem 1.2 starting from v satisfying

the condition of that theorem.

4. Though Theorem 1.3 describes the vectors that can be approached starting from a typical element in X , given a vector that can be approached, there is no algorithm to achieve the purpose. In the simplest case of Theorem 1.1 the approach to zero can be achieved algorithmically. However not much can be said in general, in this respect.

7 January 1987

1. Dani, J. S., *J. Indian Math. Soc.*, 1973, **37**, 189.
2. Dani, S. G. and Raghavan, S., *Israel J. Math.*, 1980, **36**, 300.
3. Dani, S. G., *Duke Math. J.*, 1986, **53**, 177.
4. Dani, S. G., *Ergod. Th. Dynam. Syst.*, 1986, **6**, 167.
5. Raghunathan, M. S., *Discrete subgroups of Lie groups*, Birkhauser, Berlin-Heidelberg-New York, 1972.
6. Zimmer, R. J., *Ergodic theory and semisimple groups*, Birkhauser, Boston-Basel-Stuttgart, 1984.
7. Dani, S. G., *Colloquium on dynamical systems (Guanajuato 1983)*, Soc. Mat. Mexicana, Mexico City, 1985, *Aportaciones Mat.* 1, p. 1.
8. Dani, S. G., *J. fur die reine und angew. Math.*, 1985, **359**, 55.

ANNOUNCEMENT

IX INTERNATIONAL SYMPOSIUM ON TROPICAL ECOLOGY

The IX International Symposium on Tropical Ecology will be held during December 11-16, 1987 at the Banaras Hindu University on the overall theme 'Ecological Management of Tropical Ecosystems'. The Symposium will comprise of a number of conferences, contributed paper sessions and poster sessions covering a wide variety of subjects of global importance such as land degradation and restoration, human ecology, plant geography, en-

vironmental pollution, man's impact on forest, savanna, aquatic and agroecosystems, etc.

Last date for the receipt of abstracts (not exceeding 250 words) is September 1, 1987. For details contact: Professor R. S. Ambasht, Organising Secretary, IX ISTE Symposium, Centre of Advanced Study in Botany, Banaras Hindu University, Varanasi 221 005, India.
