The cooperative gravimetric research of Venezuelan and German institutions was completed in 1988 by the observation of six stations with absolute gravity meters. These six stations serve as a reference for the International Absolute Gravity Basestation Network (1 station), the National Gravity Network (6 stations), and the Venezuelan Andes Geodynamics Network (2 stations). The precision of the absolute gravity values is estimated to be better than ± 0.1 µms⁻². In this way, the National Gravity Network obtains an average accuracy of ± 0.12 µms⁻², and the geodynamics network in the Venezuelan Andes gets an absolute orientation in level and scale. The latter network was reobserved for the fourth time during ten years by relative gravimeters simultaneously with the absolute gravity observations. We find significant seasonal gravity variations caused by tropical rainfalls and indications of small secular gravity changes.
INTRODUCTION

An inter-institutional cooperation on gravimetry is performed in Venezuela by the "Institut für Erdmessung" (IfE), University Hannover/Germany, the "Deutsches Geodätisches Forschungsinstitut, Abt.I" (DGFI/I), Munich/Germany, the "Escuela de Ingeniería Geodésica" (EIG), Zulia University at Maracaibo/Venezuela, the "Dirección de Cartografía Nacional" (DCN), Ministry of Environment and Natural Renewable Resources, Caracas/Venezuela, and the "Dirección de Geología", Ministry of Energy and Mines (MEM), Caracas/Venezuela. The cooperation was started in 1977, a main project being the monitoring of a geodynamics network along the Caribbean-South American plate boundary in the Venezuelan Andes. In the progress of this project, it was found necessary to readjust and reobserve the National Venezuelan Gravity Basestation Network (Red Gravimétrica Nacional de Venezuela, RGNV), which had been established in 1970 in the frame of the Latin American Gravity Standardization Network (McConnell et al. 1979), and served as a gravity reference system for the geodynamics network.

The RGNV suffered from a missing orientation in absolute gravity level and scale, because only very few connections had been made to the International Gravity Standardization Network (IGSN 71). It was therefore decided to add absolute gravity observations in some significant stations. The design of the absolute gravimetric network considered six of those stations, two of them being also included in the geodynamics network. One of the absolute gravity stations was placed in the Precambrian Guayana Massif, a site which was proposed by the Special Study Group 3.87 of the International Association of Geodesy (IAG) as part of the International Absolute Gravity Basestation Network (Boedecker and Fritzer 1986) for monitoring global gravity variations.

The absolute gravity observations were carried out during the months of September and October 1988. At the same time, the geodynamics network in the Venezuelan Andes was reobserved for the fourth time after 1978, 1981, and 1985 by relative gravity meters. In this way we have now a simultaneous survey and the possibility of combining absolute and relative gravimetric observations in a common adjustment. This provides for the first time the absolute level and scale of the network. Additionally the National Gravity Network can also be transformed to absolute orientation by connecting it to the absolute gravity stations.

Figure 1 presents a general view of the mentioned networks and stations and the major tectonic features of the area covered in this paper.