GWIC Statement on a Southern Hemisphere Interferometer Detector

2 December 1997

The inaugural meeting of the Gravitational-Wave International Committee* (GWIC) notes the many studies that have been made on the problem of localizing gravitational wave sources. These studies all point to the need to have, at minimum, a tetrahedral array of four detectors of comparable sensitivity operating in coincidence. Furthermore, the greater the volume of the tetrahedron the more accurately can gravitational radiation sources be localized.

Interferometers now under construction in the United States and Europe define one plane of a tetrahedron, roughly parallel to Earth's equator. The base provided by this grouping of interferometers would be greatly enhanced by the inclusion of a future interferometer in the far East.

The relatively small North-South separation of these interferometers, however, limits the capability of a solely Northern Hemisphere array to localize gravitational-wave sources.

Building on a base consisting of North American, European, and Asian detectors, a Southern Hemisphere interferometer, with its very large separations from all the Northern sites, would provide the largest enclosed volume possible on Earth. The resulting array would have much greater directional sensitivity than an exclusively Northern Hemisphere array.

In addition to the ability of this array to localize gravitational radiation sources, it is well understood that the false event rate drops dramatically as the number of detectors in coincidence increases, thus increasing the reliability of gravitational-wave detection.

GWIC notes the fruitful contribution made by ACIGA to global interferometer Research and Development and to gravitational wave physics generally with the Perth niobium bar detector. Accordingly this Committee looks forward to the day when the bar detector now in operation can be complemented by the AIGO interferometer and, with it, the full realization of a global detector array.

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