

OBSERVATIONS ON T-PHASE

The observations on T-phase have been reported and studied by many authors in different parts of the world. But the observations are very scanty as far as the Indian observatories at coastal regions are concerned. The first report on T-phase at Visakhapatnam was made by Saha (1963). The T-phase is a short period phase with period less than one second, travelling with speed of sound in water. The phase was first observed by Linehan (1940) and consequent works of Tolstoy and Ewing (1950) and Ewing, Press and Worzel (1952) have established beyond doubt that this is a guided wave in the SOFAR channel propagating with the speed of sound in water. They are mostly recorded by seismographs at coastal or inland observatories. Because T-phase is a short period phase, it is possible to record the phase with short period seismographs having proper magnification. A torsion seismometer of Wood-Anderson type with proper period of 0·8 second is quite suitable for recording the phase. The microseismograph station at Visakhapatnam was very recently established and is also equipped with two component Wood-Anderson seismograph. The observations presented in this note are from the above instrument at Visakhapatnam.

The origin of the earthquakes which gave rise to these observations is from a seismically active region near Andaman Islands. The region is quite active for shallow and small earthquakes. Accordingly it is expected that coastal observatories equipped with suitable instruments will record T-phase when shocks having slightly higher magnitude originate in this region. The observations presented in this report are from earthquakes originating from almost same place in the Andaman Islands region. The particulars of the earthquakes as given by U.S.C.G.S. are as follows—

1. Earthquake shock of 6 March 1962
Epc: Lat. $13\cdot7^{\circ}$ N and Long. $93\cdot7^{\circ}$ E
Origin time : $05^h 55^m 42\cdot3^s$
Focal depth h : about 18 km

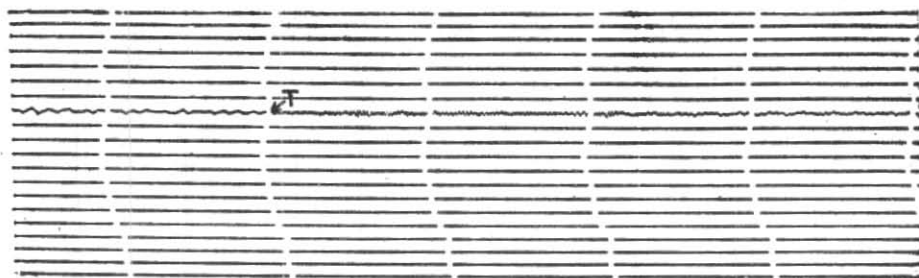


Fig. 1. Wood Anderson record of Visakhapatnam — 6 March 1962

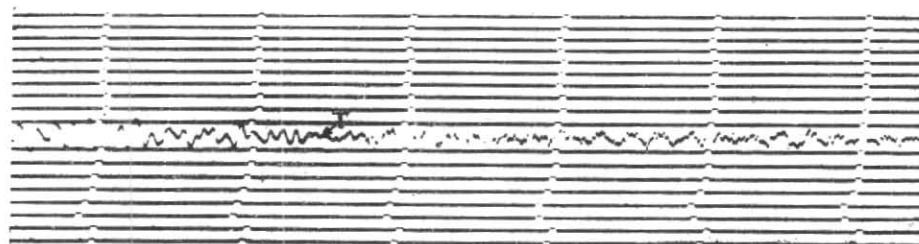


Fig. 2. Wood Anderson record of Visakhapatnam — 16 November 1962

TABLE 1

	<i>P</i>	<i>S</i>	<i>T</i>	Δ	Velocity of T-phase
Earthquake I	05 ^h 58 ^m 15.3 ^s	06 ^h 00 ^m 01.3 ^s	06 ^h 07 ^m 55.3 ^s	1165 km	1.58 km/sec
Earthquake II	21 ^h 12 ^m 30.4 ^s	21 ^h 14 ^m 15.4 ^s	21 ^h 22 ^m 05.5 ^s	1145 km	1.58 km/sec

TABLE 2

	Δ	Velocity of T-phase
Earthquake I	1198 km	1.63 km/sec
Earthquake II	1154 km	1.59 km/sec

2. Earthquake shock of 16 November 1962

Epc: Lat. 13.5° N and Long. 93.2° E

Origin time: 21^h 10^m 01.8^sFocal depth *h*: about 33 kmMag: 6-6 $\frac{1}{4}$ (Pal).

The T-phase as recorded by Wood-Anderson seismograph at Visakhapatnam is reproduced in Figs. 1 and 2. The particulars of the phase as recorded at the above station are given in Table 1.

The distance Δ could also be calculated by using geocentric co-ordinates and the results of this calculation are shown in Table 2.

The figures of velocity of T-phase are based on the assumption that the path of propagation is entirely oceanic. The velocity figures in Tables 1 and 2 are higher as compared to the mean value of 1.49 km/sec observed by others. This higher value of velocity could be accounted for if we assume that the path is partly oceanic and partly continental so that the speed is much higher in the continental crust.

An attempt was made to divide the path into two segments oceanic and continental and to determine the values of the respective segments on the assumption that the continental segment is same for all earthquakes originating from same azimuth. But the observations appear to be discrepant to arrive at any systematic solution. It might be possible to determine the values of the continental and oceanic segments when adequate and accurate observations are available.

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