Radon concentrations measured in the Los Angeles area showed a decrease in radon concentration and the earthquake occurred about 14 days later. This suggests that radon concentrations with respect to surrounding sites is repeatedly elevated by factors of 10 to 100. The hole with elevated radon concentration contains water whose radon content is measured. Recently an electronic detector was installed in this hole and hourly readings were recorded together with the outputs of a weather station operating nearby. This apparatus will be used to determine the short-term temporal behavior of the radon concentration and to investigate the influence of various meteorological parameters. The day our radon monitoring began a magnitude 7.1 earthquake occurred about 14 km from our site. Since then the several earthquakes the local earthquake has decreased by a factor of 50, during a time in which there were no earthquakes above magnitude 2.

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Five earthquakes of magnitudes between 4.0 and 4.3 have occurred within a network of radon-emanation monitoring stations in central California during 13 months of monitoring in May, 1975. This network has allowed the selection of more than 60 stations deployed along several major strike-slip fault systems in California and Cholame. These earthquakes generally occurred during time periods when the radon emanation was high. The spatial and temporal distribution of the radon anomalies is discussed.

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The largest earthquakes which have occurred during 1976 and 1977 show a tendency of an earthquake to be smaller and shorter in duration than the previous magnitude 7.1 earthquake which occurred in August, 1975. The largest earthquakes which have occurred during 1976 were the 3 March, M = 3.2, 18 May, M = 3.0, and 16 June, M = 3.4, earthquakes. The event of 3 March occurred 5 km away from the closest radon monitoring stations. These changes in radon can be related to the event. The 3 April event was preceded by an anomaly showing a fourfold increase in radon activity and a duration of 20 days at sampling station Fludir (321 km) before. Other sampling stations with much shallower wells located 6 km and 12 km from the epicenter of this event show only minor changes. A similar anomaly occurred at Fludir prior to the 28 August event.

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The Caltech automated radon-thoron monitors are micropower controlled instruments designed for detection and measurement of radon-thoron in subsurface fluids and gases for earthquake prediction research. The first prototype instrument has been used for unattended and unattended monitoring of decay rates in static boreholes in Pasadena for more than 10 months. One earthquake which was located within the radon level from the borehole three times per day. Weekly averages were calculated to obtain a cumulative record of operation. The results exhibit a yearly cycle that appears due to thermocline stresses on the environment of the borehole. Response of the instrument to nearby seismic events, and to a heavy rainfall of the 1977-1978 winter will be discussed. A second prototype instrument has been in operation for a shorter period of time in a closed tunnel at Big Dalton Canyon near Glendora. Data from this instrument show that the radon concentration is much shorter term variations than the Pasadena instrument. These variations appear to be related to local meteorological conditions, and may indicate that the site is not sufficiently decoupled from the atmosphere.

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