Direct Dark Matter Searches-
Exploiting all the signatures of the reaction

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As is well known the WMAP data have confirmed that exotic dark matter together with the vacuum energy (cosmological constant) dominate in the Universe. Many candidates viewed as constituents of dark matter exist: the lightest supersymmetric particle (LSP), Kaluza-Klein WIMPS in theories of extra dimensions, the lightest technybaryon and, more recently, the so called secluded WIMPs, which are supposed to explain the positron excess of recent cosmic ray spectra of ATIC and PAMELA etc. Thus the direct detection of dark matter, is central to particle physics and cosmology. In the standard direct dark matter searches one measures the energy of the recoiling nucleus. Many such experiments are currently under way or being planned. In such experiments, unfortunately, the interesting signal cannot be easily distinguished from the background, especially since the counting rate is very low. So, to minimize the background problems, one should exploit some characteristic signatures of the reaction, such as the seasonal variation of the rate due to the motion of the Earth, known as the modulation effect. In the standard non directional experiments, however, the modulation is small, less than two per cent, and the location of the maximum depends on the unknown particle's mass. In directional experiments, i.e. experiments in which the direction of the nuclear recoil is also registered, begin to be seriously considered as an alternative with very interesting signatures. One such is the forward-backward asymmetry due to the sun's motion around the galaxy. On top of this one also expects a much larger modulation, whose size and location depends on the direction of observation. With such characteristics it cannot be confused with other seasonal effects. If recoils in a fixed direction in the laboratory frame are observed, the above effects, due to the rotation of the Earth, will show very characteristic diurnal variation, whose size and pattern will depend on the declination of the direction of observation.