1. Ar+0.15ppm $Ge(CH_3)_4$+100ppmXe double-phase 150kg

Recoil ions, secondary and background electrons are ionizing Ar atoms by producing electron – hole pairs and exited atoms, excitons, with the following, in both cases, of self – trapped exciton luminescence, which consists of fast, singlet $^1\Sigma_u^+$ component, with τ_s **=7±1 ns** and slow, triplet $^3\Sigma_u^+$ component, with τ_t **=1.6±0.1** μ**s**.

The ratio between the singlet and triplet intensities in liquid Ar is equal to

$$\mathbf{I_s/I_t=0.3(e^-), 1.3(\alpha) \text{ and } 3(nr).} \quad (1)$$

For electron background suppression in same works the criterion is used**:**

$$\mathbf{F=I_s/(I_s+I_t).} \quad (2)$$

The ratio between the ionization and scintillation signals in liquid Ar for E=100keV, at the electric field intensity of 1 kV/cm, is equal to

$$\mathbf{S_2/S_1=150(e^-), 3(\alpha) \text{ and } 10(nr).} \quad (3)$$

The addition of about 100ppm $Xe(N_2)$ in liquid Ar allows to suppress the triplet component of scintillation signals and to increase the coefficient of background suppression. The triplet component of scintillation signals was suppressed practically completely with addition in liquid Ar of about 100ppm Xe in work [25]. The singlet component is changed little for this addition. The relationships (3) are transformed in this case in the following:

$$\mathbf{S_2/S_1=645(e^-), 5.31(\alpha) \text{ and } 13.3(nr).} \quad (4)$$

The relationship $\mathbf{(S_2/S_1)_e/(S_2/S_1)_{nr}=48.5}$ allows to suppress the electron background completely.

2. Ne+H_2 gas 25bar 45K 40kg

For detection of ionization electrons and photoelectrons the system of the needles can be used.

3. Xe+TMA double-phase 30kg

GEM

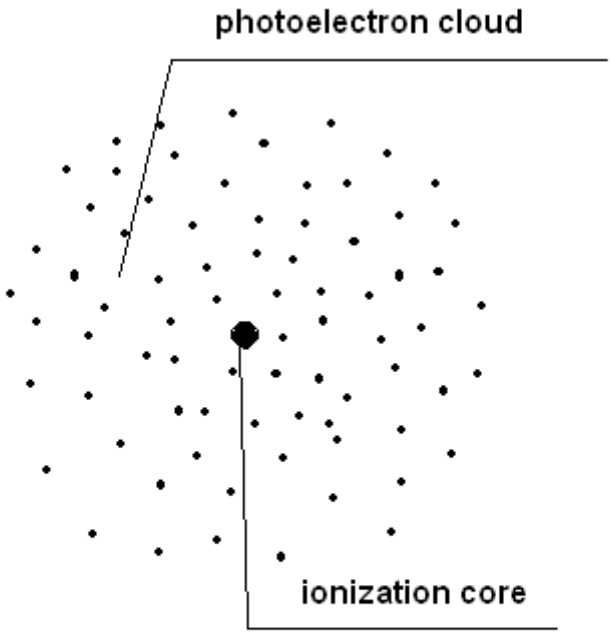

Fig 1.The event structure

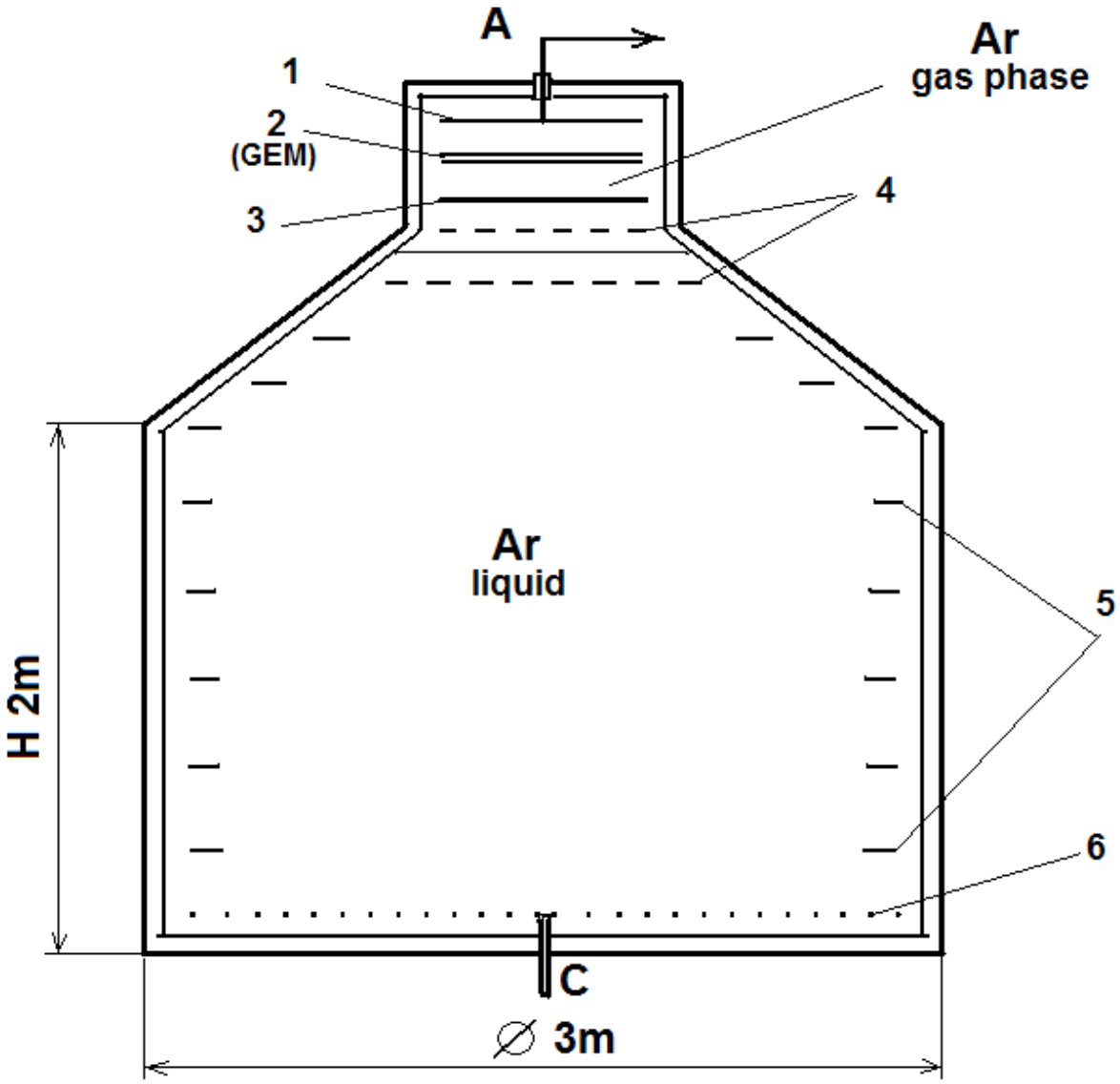

Fig.2. Double-phase Ar chamber: 1-anode, 2-GEM detectors, 3-light screen, 4- grids for electrons transport from liquid Ar to gas phase, 5-the ring electrodes for electric field level, 6-canhode.