**THE MAIN BELT ASTEROID 3628 BOZNEMCOVA AS A SOURCE OF THE LL6-CHONDRITES.** V. A. Alexeev, V. D. Gorin, L. L. Kashkarov and G. K. Ustinova. Institute of Geochemistry and Analytical Chemistry, RAS, Moscow 119991 Russia, E-mail: aval37@chgnet.ru

**Introduction:** The reflection spectrum of LL6 Manbhoom chondrite is similar to that of the 3628 Boznemcova main belt asteroid [1], which seems to be the most natural candidate parent body for two more LL6 chondrites, Bensour and Kilabo, which fell in Africa in 2002. The similarity of the petrography and fayalite composition of these chondrites can testify to the same origin of theirs [2]. We can adduce some evidence in support of that. **Pre-atmospheric sizes and orbits:** The measured density of tracks of VH-nuclei and the contents of radionuclides of $^{54}$Mn, $^{22}$Na, $^{60}$Co and $^{26}$Al in the Kilabo chondrite have been used for determination of its pre-atmospheric size and orbit by the methods developed earlier [3]: the pre-atmospheric radius of the Kilabo chondrite, average for the last ~ 8 years before the fall to the earth is $R = 34^{+6}_{-4}$ cm, the corresponding pre-atmospheric mass is equal to ~529 kg, the ablation through the passage of the earth atmosphere constitutes ~96.4%; the orbit of the Kilabo chondrite has the following elements: $q'$ = 3.6 AU, $a$ = 2.3 AU, $e$ = 0.565, and $P$ = 1273 days. Using the similar methods, we have analyzed the data of [2] on radionuclides and contents of the noble gases in the Bensour chondrite. The results show that the pre-atmospheric mass of the Bensour chondrite is 1250 kg, $R$ ~ 45 cm, and its orbital elements are as follows: $q'$ = 3.51 AU, $a$ = 2.255 AU, $e$ = 0.557, and $P$ = 1236 days. The orbits of both the chondrites can cross the orbit of the 3628 Boznemcova asteroid near the inner boundary of the asteroid belt (at 2.15 and 2.16 AU, respectively).

**Summary:** The orbit of the 3628 Boznemcova asteroid lies in the region affected by two resonances, the Kirkwood gap 3:1 at 2.5 AU and the secular resonance 6 $g = g$ at 2.1 AU, which can drive the knocked-out fragments to meteorite orbits in about 1 million years [4]. The drift of fragments into the resonance zones is facilitated by the Yarkovsky mechanism [5]. The exposure ages of the Bensour and Kilabo chondrites are different: namely, 19 and 33 million years, respectively [2]. Besides, our analysis of the tracks of VH nuclei in the Kilabo chondrite revealed a bimodal character of the distribution of pyroxene crystals with respect to the track density, which is indicative of a complicated exposure history of this chondrite. Taking into account all the information obtained, we can propose the following most probable scenario. Both the chondrites were knocked out from the 3628 Boznemcova asteroid about 19 million years ago at a distance ~2.2 AU from the sun. However, the Bensour chondrite was knocked out from deeper layers of the parent asteroid, which were completely shielded from cosmic rays, while the material of the Kilabo chondrite was probably irradiated by cosmic rays on the asteroid surface for 14 million years before being knocked out [2]. Then the chondrites drifted due to the Yarkovsky effect into the region of the secular resonance $6g = g$ , which was accompanied by variation of the semimajor axis $a$ by ~0.05 AU over ~18 million years. For the last million years, the Kilabo and Bensour chondrites were driven by this resonance to their present orbits.

**References:** [1] Binzel R.P. et al. 1993. *Science* 262 : 1541-1543. [2] Cole K.J. et al. 2007. Abstract # 1477. 38th Lunar & Planetary Science Conference. [3] Alexeev V.A. et al. 2008. *Doklady Physics* 53: 257-260. [4] Zimmerman P.D. and Wetherill G.W. 1973. *Science* 182: 51-53. [5] Hartmann W.K. et al. 1999. *eteoritics & Planetary Science* 34: A161-A167.