1075-57-77 **Jozef H. Przytycki*** (przytyck@gwu.edu), Department of Mathematics, George Washington University, Washington, DC 20052, and **Krzysztof Putyra**. *Homology of distributive lattices: splitting chain complexes.*

For a set X we consider a monoid of binary operations $Bin(X)$. The composition of operations $*_1 *_2$ is defined by $a *_1 *_2 b = (a *_1 b) *_2 b$ and the identity $*_0$ is given by $a *_0 b = a$. We say that the set $\{*_1, ..., *_k\}$ of binary operations is called a distributive set if all pairs of elements $*_i, *_j$ are right distributive The pair $(X; \{*_1, ..., *_k\})$ is called a multi-shelf.For a multi-shelf we define a multi-term homology $H_n^{(a_1,..,a_k)}(X)$ as follows. We define $C_n(X) = ZX^{n+1}$ and $\partial_n^{(*)}(x_0, , , , , x_n) = \sum_{i=0}^{n}(-1)^i(x_0 * x_i, ..., x_{i-1} * x_i, x_{i+1}, ..., x_n)$. The boundary operation of of the multi-term chain complex $(C_n(X), \partial^{(a_1,..,a_k)})$ is $\partial^{(a_1,..,a_k)} = \sum \partial^{(*_i)}$. We compute 4-term homology of finite distributive lattice $(L, *_\cup, *_\cap)$. We consider the 4-element distributive set (monoid): $\{*_0, *_\cup, *_\cap, *_\sim = *_\cap *_\cup\}$. The first part of our work is to split our chain complex into three subcomplexes: $C(X) = C(t) \oplus F^0(X,t) \oplus C(X)/(F^0 \cup C(t)$, where $C(t)$. Then we analyze each ingredient separately (this will be discussed in the second part of the talk). (Received August 22, 2011)